STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

STANDARD LOW BID PROJECT

February 28, 2006

NEW ENTRANCE STATION BUILDING
DEAD HORSE POINT STATE PARK

DIVISION PARKS & RECREATION
MOAB, UTAH

DFCM Project Number 05058510

Johansen & Tuttle Engineering
90 South 100 East
Castle Dale, Utah 84513
Phone: (435) 381-2523
Fax: (435) 381-2522

TABLE OF CONTENTS

Current copies of the following documents are hereby made part of these contract documents by reference. These documents are available on the DFCM web site at http://dfcm.utah.gov or are available upon request from DFCM.

DFCM General Conditions dated May 25, 2005.
DFCM Application and Certification for Payment dated May 25, 2005.

Technical Specifications :
Drawings:

The Agreement and General Conditions dated May 25, 2005 have been updated from versions that were formally adopted and in use prior to this date. The changes made to the General Conditions are identified in a document entitled Revisions to General Conditions that is available on DFCM's web site at http://dfcm.utah.gov

NOTICE TO CONTRACTORS

Sealed bids will be received by the Division of Facilities Construction and Management (DFCM) for:

NEW ENTRANCE STATION BUILDING - DEAD HORSE POINT STATE PARK
DIVISION OF PARKS & RECREATION – MOAB, UTAH
DFCM PROJECT NO: 05058510

Bids will be in accordance with the Contract Documents that will be available at 10:00 AM on Tuesday, February 28, 2006 and distributed in electronic format only on CDs from DFCM, 4110 State Office Building, SLC, Utah and on the DFCM web page at http://dfcm.utah.gov. For questions regarding this project, please contact Dan Clark, DFCM, at (801) 538-3725. No others are to be contacted regarding this bidding process. The construction budget for this project is $105,000.00.

A **mandatory** pre-bid meeting will be held at 10:00 AM on Thursday, March 9, 2006 at the Dead Horse Point State Park Visitors Center Conference Room, located on State Road 313 Mile Post 1.5 Moab, Utah 84532. All bidders wishing to bid on this project are required to attend this meeting.

Bids will be received until the hour of 3:30 PM on Tuesday, March 21, 2006 at DFCM, 4ll0 State Office Building, Salt Lake City, Utah 84114. Bids will be opened and read aloud in the DFCM Conference Room, 4110 State Office Building, Salt Lake City, Utah. NOTE: Bids must be received at 4110 State Office Building by the specified time.

Bid security, in the amount of five percent (5%) of the bid, must be submitted as stated in the Instruction to Bidders.

The Division of Facilities Construction and Management reserves the right to reject any or all bids or to waive any formality or technicality in any bid in the interest of DFCM.

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT
Marla Workman, Contract Coordinator
4110 State Office Building, Salt Lake City, Utah 84114

PROJECT SCHEDULE

PROJECT NAME: NEW ENTRANCE STATION BUILDING-DEAD HORSE POINT STATE PARK DIVISION OF PARKS & RECREATION – MOAB, UTAH
DFCM PROJECT # 05058510

Event	Day	Date	Time	Place
Advertisement Placed	Sunday	February 26, 2006		Multi-Media
Bidding Documents Available	Tuesday	February 28, 2006	10:00 AM	DFCM, 4110 State Office Bldg, SLC, UT or DFCM web site *
Mandatory Pre-bid Site Meeting	Thursday	March 9, 2006	10:00 AM	Dead Horse Point State Park Visitor Center-State Road 313 Mile Post 1.5, Moab, Utah
Last Day to Submit Questions	Wednesday	March 15, 2006	4:00 PM	DFCM, Dan Clark danclark@utah.gov
Final Addendum Issued	Thursday	March 16, 2006	4:00 PM	DFCM, 4110 State Office Bldg, SLC, UT or DFCM web site *
Prime Contractors Turn In Bid and Bid Bond / Bid Opening in DFCM Conference Room	Tuesday	March 21, 2006	3:30 PM	DFCM, 4110 State Office Bldg, SLC, UT
Sub-contractor List Due	Wednesday	March 22, 2006	3:30 PM	DFCM, 4110 State Office Bldg, SLC, UT

*** DFCM's web site address is http://dfcm.utah.gov**

BID FORM

NAME OF BIDDER _____ DATE _____

To the Division of Facilities Construction and Management
4110 State Office Building
Salt Lake City, Utah 84114

The undersigned, responsive to the "Notice to Contractors" and in accordance with the "Instructions to Bidders", in compliance with your invitation for bids for the **NEW ENTRANCE STATION BUILDING DEAD HORSE POINT STATE PARK – DIVISION OF PARKS & RECREATION – MOAB, UTAH - DFCM PROJECT NO. 05058510** and having examined the Contract Documents and the site of the proposed Work and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of labor, hereby proposes to furnish all labor, materials and supplies as required for the Work in accordance with the Contract Documents as specified and within the time set forth and at the price stated below. This price is to cover all expenses incurred in performing the Work required under the Contract Documents of which this bid is a part:

I/We acknowledge receipt of the following Addenda: _____

For all work shown on the Drawings and described in the Specifications and Contract Documents, I/we agree to perform for the sum of:

_____ DOLLARS ($_____)
(In case of discrepancy, written amount shall govern)

Unit Pricing

Item	Description	Unit	Price
1.	Mobilization	1	$_____
2.	New Entrance Station Building as per Plans & Specifications	1	$_____

I/We guarantee that the Work will be Substantially Complete by **June 30, 2006** after receipt of the Notice to Proceed, should I/we be the successful bidder, and agree to pay liquidated damages in the amount of **$500.00** per day for each day after expiration of the Contract Time as stated in Article 3 of the Contractor's Agreement.

This bid shall be good for 45 days after bid opening.

Enclosed is a 5% bid bond, as required, in the sum of _____

The undersigned Contractor's License Number for Utah is _____.

Upon receipt of notice of award of this bid, the undersigned agrees to execute the contract within ten (10) days, unless a shorter time is specified in the Contract Documents, and deliver acceptable Performance and Payment bonds in the prescribed form in the amount of 100% of the Contract Sum for faithful performance of the contract.

The Bid Bond attached, in the amount not less than five percent (5%) of the above bid sum, shall become the property of the Division of Facilities Construction and Management as liquidated damages for delay and additional expense caused thereby in the event that the contract is not executed and/or acceptable l00% Performance and Payment bonds are not delivered within the time set forth.

Type of Organization:

_____
(Corporation, Partnership, Individual, etc.)

Any request and information related to Utah Preference Laws:

_____

_____

Respectfully submitted,

_____
Name of Bidder

ADDRESS:

_____

_____

_____
Authorized Signature

INSTRUCTIONS TO BIDDERS

1. Drawings and Specifications, Other Contract Documents

Drawings and Specifications, as well as other available Contract Documents, may be obtained as stated in the Notice to Contractors.

Any person or firm that fails to return the complete set of Drawings and Specifications, or other contract documents, in good condition within ten (10) days after the time set for receiving bids, will forfeit the deposit. Notwithstanding this, if the Contract Documents are provided on a compact disc, the compact disc does not need to be returned.

2. Bids

Before submitting a bid, each contractor shall carefully examine the Contract Documents, shall visit the site of the Work; shall fully inform themselves as to all existing conditions and limitations; and shall include in the bid the cost of all items required by the Contract Documents. If the bidder observes that portions of the Contract Documents are at variance with applicable laws, building codes, rules, regulations or contain obvious erroneous or uncoordinated information, the bidder shall promptly notify the DFCM Representative and the necessary changes shall be accomplished by Addendum.

The bid, bearing original signatures, must be typed or handwritten in ink on the Bid Form provided in the procurement documents and submitted in a sealed envelope at the location specified by the Notice to Contractor's prior to the deadline for submission of bids. It is your responsibility to allow for the time needed to park in Capitol Hill as recent construction activity has made the parking more difficult. Identification is required to enter the building.

Bid bond security, in the amount of five percent (5%) of the bid, made payable to the Division of Facilities Construction and Management, shall accompany bid. THE BID BOND MUST BE ON THE BID BOND FORM PROVIDED IN THE PROCUREMENT DOCUMENTS IN ORDER TO BE CONSIDERED AN ACCEPTABLE BID.

If the bid bond security is submitted on a bid bond form other than DFCM's required bid bond form, and the bid security meets all other legal requirements, the bidder will be allowed to provide an acceptable bid bond by the close of business on the next business day following notification by DFCM of submission of a defective bid bond security. NOTE: A cashier's check cannot be used as a substitute for a bid bond.

3. Contract and Bond

The Contractor's Agreement will be in the form bound in the specifications. The Contract Time will be as indicated in the bid. The successful bidder, simultaneously with the execution of the Contract Agreement, will be required to furnish a performance bond and a payment bond, both bearing original

signatures, upon the forms provided in the procurement documents. The performance and payment bonds shall be for an amount equal to one hundred percent (100%) of the contract sum and secured from a company that meets the requirements specified in the requisite forms. Any bonding requirements for subcontractors will be specified in the Supplementary General Conditions.

4. Listing of Subcontractors

Listing of Subcontractors shall be as summarized in the "Instructions and Subcontractor's List Form", which are included as part of these Contract Documents. The Subcontractors List shall be delivered to DFCM or faxed to DFCM at (801)538-3677 within 24 hours of the bid opening. Requirements for listing additional subcontractors will be listed in the Contract Documents.

DFCM retains the right to audit or take other steps necessary to confirm compliance with requirements for the listing and changing of subcontractors. Any contractor who is found to not be in compliance with these requirements is subject to a debarment hearing and may be debarred from consideration for award of contracts for a period of up to three years.

5. Interpretation of Drawings and Specifications

If any person or entity contemplating submitting a bid is in doubt as to the meaning of any part of the drawings, specifications or other Contract Documents, such person shall submit to the DFCM Project Manager a request for an interpretation thereof. The person or entity submitting the request will be responsible for its prompt delivery. Any interpretation of the proposed documents will be made only by addenda duly issued and a copy of such addenda will be mailed or delivered to each person or entity receiving a set of documents. Neither the DFCM nor A/E will be responsible for any other explanations or interpretations of the proposed documents. A/E shall be deemed to refer to the architect or engineer hired by DFCM as the A/E or Consultant for the Project.

6. Addenda

Any Addenda issued during the time of bidding shall become part of the contract Documents made available to the bidders for the preparation of the bid, shall be covered in the bid, and shall be made a part of the Contract.

7. Award of Contract

The Contract will be awarded as soon as possible to the lowest, responsive and responsible bidder, based on the lowest combination of base bid and acceptable prioritized alternates, provided the bid is

reasonable, is in the interests of the State of Utah to accept and after applying the Utah Preference Laws in U.C.A. Title 63, Chapter 56. DFCM reserves the right to waive any technicalities or formalities in any bid or in the bidding. Alternates will be accepted on a prioritized basis with Alternate 1 being highest priority, Alternate 2 having second priority, etc.

8. DFCM Contractor Performance Rating

As a contractor completes each DFCM project, DFCM, the architect/engineer and the using agency will evaluate project performance based on the enclosed "DFCM Contractor Performance Rating" form. The ratings issued on this project will not affect this project but may affect the award on future projects.

9. Licensure

The Contractor shall comply with and require all of its subcontractors to comply with the license laws as required by the State of Utah.

10. Right to Reject Bids

DFCM reserves the right to reject any or all Bids.

11. Time is of the Essence

Time is of the essence in regard to all the requirements of the Contract Documents.

12. Withdrawal of Bids

Bids may be withdrawn on written request received from bidder prior to the time fixed for opening. Negligence on the part of the bidder in preparing the bid confers no right for the withdrawal of the bid after it has been opened.

13. Product Approvals

Where reference is made to one or more proprietary products in the Contract Documents, but restrictive descriptive materials of one or more manufacturer(s) is referred to in the Contract Documents, the products of other manufacturers will be accepted, provided they equal or exceed the standards set forth in the drawings and specifications and are compatible with the intent and purpose of the design, subject to the written approval of the A/E. Such written approval must occur prior to the deadline established for the last scheduled addenda to be issued. The A/E's written approval will be in an issued addendum. If the descriptive material is not restrictive, the products of other manufacturers specified will be accepted without prior approval provided they are compatible with the intent and purpose of the design as determined by the A/E.

14. Financial Responsibility of Contractors, Subcontractors and Sub-subcontractors

Contractors shall respond promptly to any inquiry in writing by DFCM to any concern of financial responsibility of the contractor, subcontractor or sub-subcontractor.

15. Debarment

By submitting a bid, the Contractor certifies that neither it nor its principals, including project and site managers, have been, or are under consideration for, debarment or suspension, or any action that would exclude such from participation in a construction contract by any governmental department or agency. If the Contractor cannot certify this statement, attach to the bid a detailed written explanation which must be reviewed and approved by DFCM as part of the requirements for award of the Project.

BID BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed, (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the STATE OF UTAH, hereinafter referred to as the "Obligee," in the amount of $_____ (5% of the accompanying bid), being the sum of this Bond to which payment the Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that whereas the Principal has submitted to Obligee the accompanying bid incorporated by reference herein, dated as shown, to enter into a contract in writing for the _____ _____ Project.

NOW, THEREFORE, THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that if the said principal does not execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the principal, then the sum of the amount stated above will be forfeited to the State of Utah as liquidated damages and not as a penalty; if the said principal shall execute a contract and give bond to be approved by the Obligee for the faithful performance thereof within ten (10) days after being notified in writing of such contract to the Principal, then this obligation shall be null and void. It is expressly understood and agreed that the liability of the Surety for any and all defaults of the Principal hereunder shall be the full penal sum of this Bond. The Surety, for value received, hereby stipulates and agrees that obligations of the Surety under this Bond shall be for a term of sixty (60) days from actual date of the bid opening.

PROVIDED, HOWEVER, that this Bond is executed pursuant to provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their several seals on the date indicated below, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

DATED this _____ day of _____, 20_____ .

Principal's name and address (if other than a corporation):

_____

_____

By: _____

Title: _____

Principal's name and address (if a corporation):

_____

_____

By: _____

Title: _____

(Affix Corporate Seal)

Surety's name and address:

_____

_____

By: _____

Attorney-in-Fact (Affix Corporate Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this ____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.
My Commission Expires: _____
Resides at: _____

_____
NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

INSTRUCTIONS AND SUBCONTRACTORS LIST FORM

The three low bidders, as well as all other bidders that desire to be considered, are required by law to submit to DFCM within 24 hours of bid opening a list of **ALL** first-tier subcontractors, including the subcontractor's name, bid amount and other information required by Building Board Rule and as stated in these Contract Documents, on the following basis:

PROJECTS UNDER $500,000 - ALL SUBS $20,000 OR OVER MUST BE LISTED
PROJECTS $500,000 OR MORE - ALL SUBS $35,000 OR OVER MUST BE LISTED

- Any additional subcontractors identified in the bid documents shall also be listed.
- The DFCM Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law.
- List subcontractors for base bid as well as the impact on the list that the selection of any alternate may have.
- Bidder may not list more than one subcontractor to perform the same work.
- Bidder must list "Self" if performing work itself.

LICENSURE:

The subcontractor's name, the type of work, the subcontractor's bid amount, and the subcontractor's license number as issued by DOPL, if such license is required under Utah Law, shall be listed. Bidder shall certify that all subcontractors, required to be licensed, are licensed as required by State law. A subcontractor includes a trade contractor or specialty contractor and does not include suppliers who provide only materials, equipment, or supplies to a contractor or subcontractor.

BIDDER LISTING 'SELF' AS PERFORMING THE WORK:

Any bidder that is properly licensed for the particular work and intends to perform that work itself in lieu of a subcontractor that would otherwise be required to be on the subcontractor list, must insert the term 'Self' for that category on the subcontractor list form. Any listing of 'Self' on the sublist form shall also include the amount allocated for that work.

'SPECIAL EXCEPTION':

A bidder may list 'Special Exception' in place of a subcontractor when the bidder intends to obtain a subcontractor to perform the work at a later date because the bidder was unable to obtain a qualified or reasonable bid under the provisions of U.C.A.Section 63A-5-208(4). The bidder shall insert the term 'Special Exception' for that category of work, and shall provide documentation with the subcontractor list describing the bidder's efforts to obtain a bid of a qualified subcontractor at a reasonable cost and why the bidder was unable to obtain a qualified subcontractor bid. The Director must find that the bidder complied in good faith with State law requirements for any 'Special Exception' designation, in order for the bid to be considered. If awarded the contract, the Director shall supervise the bidder's efforts to obtain a qualified subcontractor bid. The amount of the awarded contract may not be adjusted to reflect the actual amount of the subcontractor's bid. Any listing of 'Special Exception' on the sublist form shall also include amount allocated for that work.

GROUNDS FOR DISQUALIFICATION:

The Director may not consider any bid submitted by a bidder if the bidder fails to submit a subcontractor list meeting the requirements of State law. Director may withhold awarding the contract to a particular bidder if one or more of the proposed subcontractors are considered by the Director to be unqualified to do the Work or for such other reason in the best interest of the State of Utah. Notwithstanding any other provision in these instructions, if there is a good faith error on the sublist form, at the sole discretion of the Director, the Director may provide notice to the contractor and the contractor shall have 24 hours to submit the correction to the Director. If such correction is submitted timely, then the sublist requirements shall be considered met.

CHANGES OF SUBCONTRACTORS SPECIFICALLY IDENTIFIED ON SUBLIST FORM:

Subsequent to twenty-four hours after the bid opening, the contractor may change its listed subcontractors only after receiving written permission from the Director based on complying with all of the following criteria.

(1) The contractor has established in writing that the change is in the best interest of the State and that the contractor establishes an appropriate reason for the change, which may include, but not is not limited to, the following reasons: the original subcontractor has failed to perform, or is not qualified or capable of performing, and/or the subcontractor has requested in writing to be released.
(2) The circumstances related to the request for the change do not indicate any bad faith in the original listing of the subcontractors.
(3) Any requirement set forth by the Director to ensure that the process used to select a new subcontractor does not give rise to bid shopping.
(4) Any increase in the cost of the subject subcontractor work is borne by the contractor.
(5) Any decrease in the cost of the subject subcontractor work shall result in a deductive change order being issued for the contract for such decreased amount.
(6) The Director will give substantial weight to whether the subcontractor has consented in writing to being removed unless the Contractor establishes that the subcontractor is not qualified for the work.

EXAMPLE:

Example of a list where there are only four subcontractors:

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #
ELECTRICAL	ABCD Electric Inc.	$350,000.00	123456789000
LANDSCAPING	"Self"	300,000.00	123456789000
CONCRETE (ALTERNATE #1)	XYZ Concrete Inc	298,000.00	987654321000
MECHANICAL	"Special Exception" (attach documentation)	Fixed at: 350,000.00	(TO BE PROVIDED AFTER OBTAINING SUBCONTRACTOR)

PURSUANT TO STATE LAW - SUBCONTRACTOR BID AMOUNTS CONTAINED IN THIS SUBCONTRACTOR LIST SHALL NOT BE DISCLOSED UNTIL THE CONTRACT HAS BEEN AWARDED.

SUBCONTRACTORS LIST

FAX TO 801-538-3677

PROJECT TITLE: _____

Caution: You must read and comply fully with instructions.

TYPE OF WORK	SUBCONTRACTOR, "SELF" OR "SPECIAL EXCEPTION"	SUBCONTRACTOR BID AMOUNT	CONT. LICENSE #

We certify that:

1. This list includes all subcontractors as required by the instructions, including those related to the base bid as well as any alternates.
2. We have listed "Self" or "Special Exception" in accordance with the instructions.
3. All subcontractors are appropriately licensed as required by State law.

FIRM: _____

DATE: _____ SIGNED BY: _____

NOTICE: FAILURE TO SUBMIT THIS FORM, PROPERLY COMPLETED AND SIGNED, AS REQUIRED IN THESE CONTRACT DOCUMENTS, SHALL BE GROUNDS FOR DFCMS REFUSAL TO ENTER INTO A WRITTEN CONTRACT WITH BIDDER. ACTION MAY BE TAKEN AGAINST BIDDERS BID BOND AS DEEMED APPROPRIATE BY DFCM. ATTACH A SECOND PAGE IF NECESSARY.

FUGITIVE DUST PLAN

The Contractor will fill out the form and file the original with the Division of Air Quality and a copy of the form with the Division of Facilities Construction & Management, prior to the issuance of any notice to proceed.

The Contractor will be fully responsible for compliance with the Fugitive Dust Control Plan, including the adequacy of the plan, any damages, fines, liability, and penalty or other action that results from noncompliance.

Utah Division of Air Quality
April 20, 1999

GUIDANCE THAT MUST BE CONSIDERED IN DEVELOPING AND SUBMITTING A DUST CONTROL PLAN FOR COMPLIANCE WITH R307-309-3, 4, 5, 6, 7

Source Information:

1. Name of your operation (source): provide a name if the source is a construction site.

2. Address or location of your operation or construction site.

3. UTM coordinates or Longitude/Latitude of stationary emission points at your operation.

4. Lengths of the project, if temporary (time period).

5. Description of process (include all sources of dust and fugitive dust). Please, if necessary, use additional sheets of paper for this description. Be sure to mark it as an attachment.

6. Type of material processed or disturbed.

7. Amount of material processed (tons per year, tons per month, lbs./hr., and applicable units).

8. Destination of product (where will the material produced be used or transported, be specific, provide address or specific location), information needed for temporary relocation applicants.

9. Identify the individual who is responsible for the implementation and maintenance of fugitive dust control measures. List name(s), position(s) and telephone number(s).

10. List, and attach copies of any contract lease, liability agreement with other companies that may, or will, be responsible for dust control on site or on the project.

Description of Fugitive Dust Emission Activities
(Things to consider in addressing fugitive dust control strategies.)

1. Type of activities (drilling and blasting, road construction, development construction, earth moving and excavation, handling and hauling materials, cleaning and leveling, etc).

2. List type of equipment generating the fugitive dust.

3. Diagram the location of each activity or piece of equipment on site. Please attach the diagram.

4. Provide pictures or drawings of each activity. Include a drawing of the unpaved/paved road network used to move loads "on" and "off" property.

5. Vehicle miles travels on unpaved roads associated with the activity (average speed).

6. Type of dust emitted at each source (coal, cement, sand, soil, clay, dust, etc.)

7. Estimate the size of the release area at which the activity occurs (square miles). For haul or dirt roads include total miles of road in use during the activity.

Description of Fugitive Dust Emission Controls on Site

Control strategies must be designed to meet 20% opacity or less on site (a lesser opacity may be defined by Approval Order conditions or federal requirements such as NSPS), and control strategies must prevent exceeding 10% opacity from fugitive dust at the property boundary (site boundary) for compliance with R307-309-3.

1. Types of ongoing emission controls proposed for each activity, each piece of equipment, and haul roads.

2. Types of additional dust controls proposed for bare, exposed surfaces (chemical stabilization, synthetic cover, wind breaks, vegetative cover, etc).

3. Method of application of dust suppressant.

4. Frequency of application of dust suppressant.

5. Explain what triggers the use of a special control measure other than routine measures already in place, such as covered loads or measures covered by a permit condition (increase in opacity, high winds, citizen complaints, dry conditions, etc).

6. Explain in detail what control strategies/measures will be implemented off-hours, i.e., Saturdays/Sundays/Holidays, as well as 6 PM to 6 AM each day.

Description of Fugitive Dust Control Off-site

Prevent, to the maximum extent possible, deposition of materials, which may create fugitive dust on public and private paved roads in compliance with R307-309-5, 6, 7.

1. Types of emission controls initiated by your operation that are in place "off" property (application of water, covered loads, sweeping roads, vehicle cleaning, etc.).

2. Proposed remedial controls that will be initiated promptly if materials, which may create fugitive dust, are deposited on public and private paved roads.

Submit the Dust Control Plan to:

Executive Secretary
Utah Air Quality Board
POB 144820
15 North 1950 West
Salt Lake City, Utah 84114-4820

Phone: (801) 536-4000
FAX: (801) 536-4099

Fugitive Dust Control Plan Violation Report

When a source is found in violation of R307-309-3 or in violation of the Fugitive Dust Control Plan, the course must submit a report to the Executive Secretary within 15 days after receiving a Notice of Violation. The report must include the following information:

1. Name and address of dust source.

2. Time and duration of dust episode.

3. Meteorological conditions during the dust episode.

4. Total number and type of fugitive dust activities and dust producing equipment within each operation boundary. If no change has occurred from the existing dust control plan, the source should state that the activity/equipment is the same.

5. Fugitive dust activities or dust producing equipment that caused a violation of R-307-309-3 or the sources dust control plan.

6. Reasons for failing to control dust from the dust generating activity or equipment.

7. New and/or additional fugitive dust control strategies necessary to achieve compliance with R307-309-3, 4, 5, 6, or 7.

8. If it can not be demonstrated that the current approved Dust Control Plan can result in compliance with R307-309-3 through 7, the Dust Control Plan must be revised so as to demonstrate compliance with 307-309-3 through 7. Within 30 days of receiving a fugitive dust Notice of Violation, the source must submit the revised Plan to the Executive Secretary for review and approval.

Submit the Dust Control Plan to:

Executive Secretary
Utah Air Quality Board
POB 144820
15 North 1950 West
Salt Lake City, Utah 84114-4820

Phone: (801) 536-4000
FAX: (801) 536-4099

Attachments: DFCM Form FDR R-307-309, Rule 307-309

CONTRACTOR'S AGREEMENT

FOR:

_____
_____
_____

THIS CONTRACTOR'S AGREEMENT, made and entered into this ____ day of _____, 20__, by and between the DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT, hereinafter referred to as "DFCM", and _____, incorporated in the State of _____ and authorized to do business in the State of Utah, hereinafter referred to as "Contractor", whose address is _____.

WITNESSETH: WHEREAS, DFCM intends to have Work performed at _____ _____.

WHEREAS, Contractor agrees to perform the Work for the sum stated herein.

NOW, THEREFORE, DFCM and Contractor for the consideration provided in this Contractor's Agreement, agree as follows:

ARTICLE 1. SCOPE OF WORK. The Work to be performed shall be in accordance with the Contract Documents prepared by _____ and entitled "_____."

The DFCM General Conditions ("General Conditions") dated May 25, 2005 on file at the office of DFCM and available on the DFCM website, are hereby incorporated by reference as part of this Agreement and are included in the specifications for this Project. All terms used in this Contractor's Agreement shall be as defined in the Contract Documents, and in particular, the General Conditions.

The Contractor Agrees to furnish labor, materials and equipment to complete the Work as required in the Contract Documents which are hereby incorporated by reference. It is understood and agreed by the parties hereto that all Work shall be performed as required in the Contract Documents and shall be subject to inspection and approval of DFCM or its authorized representative. The relationship of the Contractor to the DFCM hereunder is that of an independent Contractor.

ARTICLE 2. CONTRACT SUM. The DFCM agrees to pay and the Contractor agrees to accept in full performance of this Contractor's Agreement, the sum of _____ _____ DOLLARS AND NO CENTS ($_____.00), which is the base bid, and which sum also includes the cost of a 100% Performance Bond and a 100%

Payment Bond as well as all insurance requirements of the Contractor. Said bonds have already been posted by the Contractor pursuant to State law. The required proof of insurance certificates have been delivered to DFCM in accordance with the General Conditions before the execution of this Contractor's Agreement.

ARTICLE 3. TIME OF COMPLETION AND DELAY REMEDY. The Work shall be Substantially Complete within _____ (___) calendar days after the date of the Notice to Proceed. Contractor agrees to pay liquidated damages in the amount of $_____ per day for each day after expiration of the Contract Time until the Contractor achieves Substantial Completion in accordance with the Contract Documents, if Contractor's delay makes the damages applicable. The provision for liquidated damages is: (a) to compensate the DFCM for delay only; (b) is provided for herein because actual damages can not be readily ascertained at the time of execution of this Contractor's Agreement; (c) is not a penalty; and (d) shall not prevent the DFCM from maintaining Claims for other non-delay damages, such as costs to complete or remedy defective Work.

No action shall be maintained by the Contractor, including its or Subcontractor or suppliers at any tier, against the DFCM or State of Utah for damages or other claims due to losses attributable to hindrances or delays from any cause whatsoever, including acts and omissions of the DFCM or its officers, employees or agents, except as expressly provided in the General Conditions. The Contractor may receive a written extension of time, signed by the DFCM, in which to complete the Work under this Contractor's Agreement in accordance with the General Conditions.

ARTICLE 4. CONTRACT DOCUMENTS. The Contract Documents consist of this Contractor's Agreement, the Conditions of the Contract (DFCM General Conditions, Supplementary and other Conditions), the Drawings, Specifications, Addenda and Modifications. The Contract Documents shall also include the bidding documents, including the Notice to Contractors, Instructions to Bidders/ Proposers and the Bid/Proposal, to the extent not in conflict therewith and other documents and oral presentations that are documented as an attachment to the contract.

All such documents are hereby incorporated by reference herein. Any reference in this Contractor's Agreement to certain provisions of the Contract Documents shall in no way be construed as to lessen the importance or applicability of any other provisions of the Contract Documents.

ARTICLE 5. PAYMENT. The DFCM agrees to pay the Contractor from time to time as the Work progresses, but not more than once each month after the date of Notice to Proceed, and only upon Certificate of the A/E for Work performed during the preceding calendar month, ninety-five percent (95%) of the value of the labor performed and ninety-five percent (95%) of the value of materials furnished in place or on the site. The Contractor agrees to furnish to the DFCM invoices for materials purchased and on the site but not installed, for which the Contractor requests payment and agrees to

safeguard and protect such equipment or materials and is responsible for safekeeping thereof and if such be stolen, lost or destroyed, to replace same.

Such evidence of labor performed and materials furnished as the DFCM may reasonably require shall be supplied by the Contractor at the time of request for Certificate of Payment on account. Materials for which payment has been made cannot be removed from the job site without DFCM's written approval. Five percent (5%) of the earned amount shall be retained from each monthly payment. The retainage, including any additional retainage imposed and the release of any retainage, shall be in accordance with UCA 13-8-5 as amended. Contractor shall also comply with the requirements of UCA 13-8-5, including restrictions of retainage regarding subcontractors and the distribution of interest earned on the retention proceeds. The DFCM shall not be responsible for enforcing the Contractor's obligations under State law in fulfilling the retention law requirements with subcontractors at any tier.

ARTICLE 6. INDEBTEDNESS. Before final payment is made, the Contractor must submit evidence satisfactory to the DFCM that all payrolls, materials bills, subcontracts at any tier and outstanding indebtedness in connection with the Work have been properly paid. Final Payment will be made after receipt of said evidence, final acceptance of the Work by the DFCM as well as compliance with the applicable provisions of the General Conditions.

Contractor shall respond immediately to any inquiry in writing by DFCM as to any concern of financial responsibility and DFCM reserves the right to request any waivers, releases or bonds from Contractor in regard to any rights of Subcontractors (including suppliers) at any tier or any third parties prior to any payment by DFCM to Contractor.

ARTICLE 7. ADDITIONAL WORK. It is understood and agreed by the parties hereto that no money will be paid to the Contractor for additional labor or materials furnished unless a new contract in writing or a Modification hereof in accordance with the General Conditions and the Contract Documents for such additional labor or materials has been executed. The DFCM specifically reserves the right to modify or amend this Contractor's Agreement and the total sum due hereunder either by enlarging or restricting the scope of the Work.

ARTICLE 8. INSPECTIONS. The Work shall be inspected for acceptance in accordance with the General Conditions.

ARTICLE 9. DISPUTES. Any dispute, PRE or Claim between the parties shall be subject to the provisions of Article 7 of the General Conditions. DFCM reserves all rights to pursue its rights and remedies as provided in the General Conditions.

ARTICLE 10. TERMINATION, SUSPENSION OR ABANDONMENT. This Contractor's Agreement may be terminated, suspended or abandoned in accordance with the General Conditions.

ARTICLE 11. DFCM'S RIGHT TO WITHHOLD CERTAIN AMOUNT AND MAKE USE THEREOF. The DFCM may withhold from payment to the Contractor such amount as, in DFCM's judgment, may be necessary to pay just claims against the Contractor or Subcontractor at any tier for labor and services rendered and materials furnished in and about the Work. The DFCM may apply such withheld amounts for the payment of such claims in DFCM's discretion. In so doing, the DFCM shall be deemed the agent of Contractor and payment so made by the DFCM shall be considered as payment made under this Contractor's Agreement by the DFCM to the Contractor. DFCM shall not be liable to the Contractor for any such payment made in good faith. Such withholdings and payments may be made without prior approval of the Contractor and may be also be prior to any determination as a result of any dispute, PRE, Claim or litigation.

ARTICLE 12. INDEMNIFICATION. The Contractor shall comply with the indemnification provisions of the General Conditions.

ARTICLE 13. SUCCESSORS AND ASSIGNMENT OF CONTRACT. The DFCM and Contractor, respectively bind themselves, their partners, successors, assigns and legal representatives to the other party to this Agreement, and to partners, successors, assigns and legal representatives of such other party with respect to all covenants, provisions, rights and responsibilities of this Contractor's Agreement. The Contractor shall not assign this Contractor's Agreement without the prior written consent of the DFCM, nor shall the Contractor assign any moneys due or to become due as well as any rights under this Contractor's Agreement, without prior written consent of the DFCM.

ARTICLE 14. RELATIONSHIP OF THE PARTIES. The Contractor accepts the relationship of trust and confidence established by this Contractor's Agreement and covenants with the DFCM to cooperate with the DFCM and A/E and use the Contractor's best skill, efforts and judgment in furthering the interest of the DFCM; to furnish efficient business administration and supervision; to make best efforts to furnish at all times an adequate supply of workers and materials; and to perform the Work in the best and most expeditious and economic manner consistent with the interests of the DFCM.

ARTICLE 15. AUTHORITY TO EXECUTE AND PERFORM AGREEMENT. Contractor and DFCM each represent that the execution of this Contractor's Agreement and the performance thereunder is within their respective duly authorized powers.

ARTICLE 16. ATTORNEY FEES AND COSTS. Except as otherwise provided in the dispute resolution provisions of the General Conditions, the prevailing party shall be entitled to reasonable attorney fees and costs incurred in any action in the District Court and/or appellate body to enforce this Contractor's Agreement or recover damages or any other action as a result of a breach thereof.

IN WITNESS WHEREOF, the parties hereto have executed this Contractor's Agreement on the day and year stated hereinabove.

CONTRACTOR: _____

_____
Signature Date

Title: _____

State of _____)
)
County of _____) _____
Please type/print name clearly

On this ____ day of _____, 20____, personally appeared before me, _____, whose identity is personally known to me (or proved to me on the basis of satisfactory evidence) and who by me duly sworn (or affirmed), did say that he (she) is the _____ (title or office) of the firm and that said document was signed by him (her) in behalf of said firm.

_____
Notary Public

(SEAL)

My Commission Expires _____

APPROVED AS TO AVAILABILITY OF FUNDS:

_____
Financial Manager, Date
Division of Facilities Construction and Management

DIVISION OF FACILITIES CONSTRUCTION AND MANAGEMENT

_____
_____ Date
Manager -
Capital _____

APPROVED AS TO FORM:
ATTORNEY GENERAL
May 25, 2005
By: Alan S. Bachman
Asst Attorney General

APPROVED FOR EXPENDITURE:

_____
Division of Finance Date

PERFORMANCE BOND

(Title 63, Chapter 56, U. C. A. 1953, as Amended)

That _____ hereinafter referred to as the "Principal" and _____, a corporation organized and existing under the laws of the State of _____, with its principal office in the City of _____ and authorized to transact business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah, hereinafter referred to as the "Obligee, " in the amount of _____ _____ DOLLARS ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____, for the approximate sum of _____ _____ Dollars ($_____), which Contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall faithfully perform the Contract in accordance with the Contract Documents including, but not limited to, the Plans, Specifications and conditions thereof, the one year performance warranty, and the terms of the Contract as said Contract may be subject to Modifications or changes, then this obligation shall be void; otherwise it shall remain in full force and effect.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the state named herein or the heirs, executors, administrators or successors of the Owner.

The parties agree that the dispute provisions provided in the Contract Documents apply and shall constitute the sole dispute procedures of the parties.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the Provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20_____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____

(Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)

) ss.

COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney in-fact of the above-named Surety Company and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____

Resides at: _____

_____

NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

DFCM FORM 1b 052505

PAYMENT BOND

(Title 63, Chapter 56, U. C. A. l953, as Amended)

KNOW ALL PERSONS BY THESE PRESENTS:

That _____ hereinafter referred to as the "Principal," and _____ _____, a corporation organized and existing under the laws of the State of _____authorized to do business in this State and U. S. Department of the Treasury Listed (Circular 570, Companies Holding Certificates of Authority as Acceptable Securities on Federal Bonds and as Acceptable Reinsuring Companies); with its principal office in the City of _____, hereinafter referred to as the "Surety," are held and firmly bound unto the State of Utah hereinafter referred to as the "Obligee," in the amount of _____ Dollars ($_____) for the payment whereof, the said Principal and Surety bind themselves and their heirs, administrators, executors, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the Principal has entered into a certain written Contract with the Obligee, dated the _____ day of _____, 20____, to construct _____ in the County of _____, State of Utah, Project No. _____ for the approximate sum of _____ _____ Dollars ($_____), which contract is hereby incorporated by reference herein.

NOW, THEREFORE, the condition of this obligation is such that if the said Principal shall pay all claimants supplying labor or materials to Principal or Principal's Subcontractors in compliance with the provisions of Title 63, Chapter 56, of Utah Code Annotated, l953, as amended, and in the prosecution of the Work provided for in said Contract, then, this obligation shall be void; otherwise it shall remain in full force and effect.

That said Surety to this Bond, for value received, hereby stipulates and agrees that no changes, extensions of time, alterations or additions to the terms of the Contract or to the Work to be performed thereunder, or the specifications or drawings accompanying same shall in any way affect its obligation on this Bond, and does hereby waive notice of any such changes, extensions of time, alterations or additions to the terms of the Contract or to the Work or to the specifications or drawings and agrees that they shall become part of the Contract Documents.

PROVIDED, HOWEVER, that this Bond is executed pursuant to the provisions of Title 63, Chapter 56, Utah Code Annotated, 1953, as amended, and all liabilities on this Bond shall be determined in accordance with said provisions to the same extent as if it were copied at length herein.

IN WITNESS WHEREOF, the said Principal and Surety have signed and sealed this instrument this _____ day of _____, 20____.

WITNESS OR ATTESTATION:

_____

PRINCIPAL:

_____

By: _____

(Seal)

Title: _____

WITNESS OR ATTESTATION:

_____

SURETY:

_____

By: _____

Attorney-in-Fact (Seal)

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, 20____, personally appeared before me _____ _____, whose identity is personally known to me or proved to me on the basis of satisfactory evidence, and who, being by me duly sworn, did say that he/she is the Attorney-in-fact of the above-named Surety Company, and that he/she is duly authorized to execute the same and has complied in all respects with the laws of Utah in reference to becoming sole surety upon bonds, undertakings and obligations, and that he/she acknowledged to me that as Attorney-in-fact executed the same.

Subscribed and sworn to before me this _____ day of _____, 20_____.

My commission expires: _____

Resides at: _____

_____

NOTARY PUBLIC

Agency: _____
Agent: _____
Address: _____
Phone: _____

Approved As To Form: May 25, 2005
By Alan S. Bachman, Asst Attorney General

DFCM FORM 1b 052505

CHANGE ORDER #_____

CONTRACTOR:

ARCHITECT:

AGENCY OR INSTITUTION:
PROJECT NAME:
PROJECT NUMBER:
CONTRACT NUMBER:
DATE:

CONSTRUCTION CHANGE DIRECTIVE NO.	PROPOSAL REQUEST NO.	AMOUNT		DAYS	
		INCREASE	DECREASE	INCREASE	DECREASE

	Amount	Days	Date
ORIGINAL CONTRACT			
TOTAL PREVIOUS CHANGE ORDERS			
TOTAL THIS CHANGE ORDER			
ADJUSTED CONTRACT			

DFCM and Contractor agree that the terms, contract sum, scope of the Work and time specified in this Change Order shall constitute the full accord and satisfaction, and complete adjustment to the Contract and includes all direct and indirect costs and effects related to, incidental to, and/or reasonably implied from such change in the contract terms, sum, scope of the Work and time.

Contractor:_____
Date

Architect/Engineer:_____
Date

Agency or Institution:_____
Date

DFCM: _____
Date

Funding Verification:_____
Date

STATE OF UTAH - DEPARTMENT OF ADMINISTRATIVE SERVICES

Division of Facilities Construction and Management

DFCM

CERTIFICATE OF SUBSTANTIAL COMPLETION

PROJECT _____ PROJECT NO: _____

AGENCY/INSTITUTION _____

AREA ACCEPTED _____

The Work performed under the subject Contract has been reviewed on this date and found to be Substantially Completed as defined in the General Conditions; including that the construction is sufficiently completed in accordance with the Contract Documents, as modified by any change orders agreed to by the parties, so that the State of Utah can occupy the Project or specified area of the Project for the use for which it is intended.

The DFCM - (Owner) accepts the Project or specified area of the Project as Substantially Complete and will assume full possession of the Project or specified area of the Project at _____ (time) on _____ (date).

The DFCM accepts the Project for occupancy and agrees to assume full responsibility for maintenance and operation, including utilities and insurance, of the Project subject to the itemized responsibilities and/or exceptions noted below:

_____

_____

The Owner acknowledges receipt of the following closeout and transition materials:

☐ Record Drawings ☐ O & M Manuals ☐ Warranty Documents ☐ Completion of Training Requirements

A list of items to be completed or corrected (Punch List) is attached hereto. The failure to include an item on it does not alter the responsibility of the Contractor to complete all the Work in accordance with the Contract Documents, including authorized changes thereof. The amount of_____. (Twice the value of the punch list work) shall be retained to assure the completion of the punch list work.

The Contractor shall complete or correct the Work on the list of (Punch List) items appended hereto within _____ ____calendar days from the above date of issuance of this Certificate. If the list of items is not completed within the time allotted the Owner has the right to be compensated for the delays and/or complete the work with the help of independent contractor at the expense of the retained project funds. If the retained project funds are insufficient to cover the delay/completion damages, the Owner shall be promptly reimbursed for the balance of the funds needed to compensate the Owner.

_____ by: _____

CONTRACTOR (include name of firm) (Signature) DATE

_____ by: _____

A/E (include name of firm) (Signature) DATE

_____ by: _____

USING INSTITUTION OR AGENCY (Signature) DATE

_____ by: _____

DFCM (Owner) (Signature) DATE

4110 State Office Building, Salt Lake City, Utah 84114
telephone 801-538-3018 • facsimile 801-538-3267 • http://dfcm.utah.gov

cc: Parties Noted
DFCM, Director

CONSTRUCTION SPECIFICATION

SPECIAL CONDITIONS

1. **SCOPE**

This section of the specifications cover specific requirements, instructions and conditions applicable to this project only, which are not covered by the General Conditions or detailed specifications. Should there be conflicting statements between this section and other sections of these specifications, this section shall govern.

2. **STANDARD PRODUCTS**

The material brand names and catalog numbers shown on the drawings or called out in the specifications are meant to set a standard that all other materials should meet. The Contractor or supplier is encouraged to submit information and data to show his material is equal. The decision of the Engineer shall be final in this section.

3. **MAINTENANCE OF TRAFFIC**

The Contractor shall at all times conduct his operations so that there is a minimum of interruptions of the highway. Timing and methods of any highway clousure shall be approved by the Owner and the Engineer. The exact procedure for any interruption of traffic, for providing detours when required, for providing flag men when required, and for providing passage into and through work areas for essential traffic shall be worked out in advance of the phase of construction involved, between the Contractor, Engineer, and state highway officials.

4. **CONTRACTOR TO MAINTAIN AND REPLACE STAKES**

The Contractor shall furnish without charge, competent men from his force, stakes, tools and other materials, for the proper staking out of the work, in making measurements and surveys, and in establishing temporary or permanent reference marks in connection with the work. This does not mean to imply, the Contractor is to pay for initial staking, as this will be the cost of the Owner.

Initial staking to be provided by the Owner will be the establishment of:

a. Bench Marks.

b. Original lines and grades necessary for horizontal and vertical control of the construction of the permanent works.

c. Right-of-way limits acquired through permits from Federal Agencies.

The Contractor shall provide surveys necessary to maintain the lines and grades during the construction of the permanent works.

5. LINES AND GRADES

All work done under this contract shall be done to the line, grades, and elevations shown on the plans, or as directed by the Engineer. The Contractor shall keep the Engineer informed, a reasonable time in advance, of the times and places at which he intends to do work, in order that lines and grades may be furnished and necessary measurements for record and payment may be made with the minimum of inconvenience to the Engineer and delay to the Contractor.

6. PAYMENT OF SUPPLIES AND SUBCONTRACTORS

It is intended that the Contractor and subcontractor make full monthly payments to their suppliers and subcontractors as invoices are rendered. Such invoices shall be deemed as paid at the time each monthly certificate of payment is prepared by the Engineer. Affidavits will be submitted by the Contractor each as means of certifying to the Engineer that all equipment and materials delivered has been paid for. This will be the normal proof of payment; however, the Engineer will have the right at any time to demand copies of certified paid invoices. Failure or inability to provide such paid invoices will be sufficient cause for hold-up for further monthly pay estimates.

7. GENERAL SAFETY REQUIREMENTS

Excavations

a. This section shall apply to all excavations in which workmen may be exposed to hazard of collapse of the banks, sides, or walls, during the time construction work is in process.

b. All excavations shall be guarded by shoring, bracing or underpinning, or other methods as may be necessary to prevent injury to workmen resulting from the sides caving in.

c. Excavated or other material must be deposited a safe distance from the edge of the excavation so as to prevent its falling or sliding back into the excavation.

d. No trenches shall be left open at any time unless guarded with adequate barricades, warning lamps, and signs.

e. Contractor's foremen and superintendents shall know where to obtain an oxygen resuscitator for use in an emergency. The phone number to call for immediate resuscitator and ambulance service shall be posted in all Contractors trench and at

conspicuous places on the project at all times.

8. **CERTIFICATIONS**

Certifications that all materials used in the construction of the permanent works meet these specifications will be required. These certifications shall include the contract number, project name, bid item number, material furnished, applicable specification number and quantity furnished.

9. **TEST**

Test results that are required from the Contractor at the Contractor's expense will be performed as specified in the specifications. Duplicate copies of the test results shall be furnished to the Engineer for his approval at least 10 days prior to the use of the materials in the permanent works. All "on site" testing shall be made in the presence of and be approved by the Engineer or his representative. Written test results for "on site" tests will not be required.

10. **LIQUIDATED DAMAGES**

If the work, or any part thereof, is not completed within the time agreed upon in this contract or any extension thereof, the contractor shall be liable to the owner in the amount of $500.00 per day for each and every calendar day the completion of the work is delayed beyond the time provided in this contract, as fixed and agreed liquidated damages and not as a penalty, and the Owner shall have the right to deduct from the retainage of the moneys which may be then due or which may be due and payable to the Contractor, the amount of the liquidated damages; and if the amount so retained by the owner is insufficient to pay in full such liquidated damages, the Contractor shall pay to the Owner the amount necessary to effect payment in full of such liquidated damages.

11. **EXISTING UTILITIES**

The Contractor shall notify Blue Stakes 48 hours prior to excavating to ensure as nearly uninterrupted service as is reasonably proper. The Contractor shall not claim extra compensation or time extensions due to delays resulting from private utilities.

12. **EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS, AND SITES**

The bidder is required to examine carefully the site of the proposed work, the proposal, plans, specifications, supplemental specification, special provision, and contract forms before submitting a proposal.

The submission of a bid shall be considered PRIMA FACIE evidence that the Bidder has

made the required examinations and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the contract.

13. **AVAILABILITY OF MEN AND EQUIPMENT**

The Contractor shall have men and equipment available on weekends and holidays to cope with emergency conditions, flooding, etc., which may arise as a result of his operations. Phone numbers or addresses shall be provided in writing to the Owner.

14. **DUST CONTROL**

The Contractor will be required to provide dust control through the use of water truck when, in the opinion of the Engineer, dust becomes excessive.

15. **WASTE MATERIAL**

The Contractor shall be responsible for disposal of waste material from the site. Disposal area must be approved by the Engineer prior to use.

16. **SUPERVISION BY CONTRACTOR**

The Contractor will supervise and direct work. He will be solely responsible for the means, techniques, sequences and procedures of construction. The Contractor will employ and maintain on the work site a qualified supervisor or superintendent who shall have been designated in writing by the Contractor as the contractors representative at the site. The supervisor or superintendent shall have full authority to act on behalf of the contractor and all communications given to the supervisor shall be as binding as if given to the contractor. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the work.

17. **CONTRACTOR'S PERSONNEL**

All work under this contract shall be performed in a skillful and workmanlike manner. The Owner may, in writing, require the Contractor to remove from the work any employee the Owner deems incompetent, careless, or otherwise objectionable.

18. **GENERAL PROVISION AMENDMENT**

Article 16 "Dispute Resolution" of the general provisions is herein deleted. Exhibit GC-A, "Dispute Resolution Agreement" will not be used to resolve disputes that may arise under this agreement. All claims, disputes and other matters in question between Owner and Contractor arising out of, or relating to the Contract Documents, or the breach thereof, except for claims which have been waived by the making or acceptance of final payment as provided by paragraph 14.15 shall be decided through regular civil court procedures and this

contract can not be misconstrued as an agreement to arbitrate.

19. **GUARANTEE OF THE WORK**

The Contractor shall, for a period of one(1) year after completion and acceptance of the work, maintain and repair any defective work which may occur to the permanent work.

20. **RETAINAGE ON PROGRESS PAYMENTS**

Five percent (5%) will be retained on each progress payment to the Contractor until final completion and acceptance of all work.

21. **LIABILITY INSURANCE**

Before the contract is executed the Contractor with the successful bid shall be required to furnish to Owner, a copy of the public liability and property damage insurance policy in an amount of no less than $2,000,000 each occurance which is to be in force and applicable to the project. In addition, the Contractor shall be required to furnish, at the same time a letter from agent for the company holding said policy, stating that he will inform Owner of any change in the status of the policy.

22. **PERMITS TO WORK ON PUBLIC RIGHT OF WAYS**

Contractor shall obtain the necessary permits and provide the required bonds to work within the State Road Right-of-Way. Compliance with all permit provisions will be required of this contract.

23. **UTAH STATE LAW 34**

Contractor will comply with all of the current provisions of title, 34, Chapter 30, UCA, as amended.

24. **INDEMNIFICATION**

The contractor agrees that it/he shall at all times protect and indemnify and save harmless, DFCM, and DFCM's consultants from any and all claims, demands, judgments, expenses, including reasonable attorney's fees and all other damages of every kind and nature made, rendered or incurred by or in behalf of any person or corporation whatsoever, including the parties hereto and their employees that may arise, occur or grow out of any acts, actions, work or other activity done by the said Contractor in the performance and execution of this Contract.

25. **WEEKEND AND OVERTIME WORK**

The Contractor shall not work after the hours of 5:00 p.m., before 8:00 a.m., or on Saturdays, Sundays, or holidays without written consent of the Engineer.

Weekends (Saturday or Sunday) and Holidays that have inclement weather will not be used for time extension unless the Contractor has received prior written permission from the Engineer to work.

CONSTRUCTION SPECIFICATION

5. BUILDING CONSTRUCTION

1. **SCOPE**

This item consist of the work necessary to furnish the materials, labor, tools, equipment and services necessary to construct the building, complete as described in the Contract Drawings and Specifications. Building materials and construction methods shall comply to applicable building codes.

2. **SUBMITTALS**

The Contractor shall submit, in triplicate, to the Engineer for his approval shop drawings and/or catalogs cuts for fabricated and manufactured items. The submittal shall be made on less than 10 days prior to the time when parts are ordered. Specific information required by the Engineer is as follows:

a. The proposed location and routing of all piping located within or underneath the building shall be submitted to the Engineer for approval.

b. The proposed type and method of fastening for the roofing material, roof insulation, trusses and methods proposed for cornice construction shall be submitted to the Engineer for approval.

c. The proposed types of windows, doors, cabinets, shelves, and miscellaneous structural items shall be submitted to the Engineer for approval.

d. These drawings shall be accurate, distinct and complete and shall contain all required information, including satisfactory identification of items, units and assemblies in relation to the Contract Drawings and/or Specifications.

3. **MATERIALS**

a. Steel Reinforcement: All steel reinforcement shall be placed in the concrete as shown on the plans. Grade 60 steel shall be used.

b. Foam Block: The block units to be used for the completion of this items shall be natural color, hollow load bearing block of nominal size as indicated on the plans, proper sized shall be used to provide for all windows, doors, bond beams, etc., with a minimum of cutting.

Block units shall be manufactured to meet ASTM C90 Grade S-1 requirements

for hollow load bearing concrete masonry units. Block units shall have a maximum linear shrinkage of not more than 0.05 percent from a saturated to oven-dry condition, when tested in accordance with the methods set forth in the Quality Control Standards of the Concrete Masonry Association.

The block shall be ordered four-weeks prior to commencement of work to assure units form a uniform run. Samples of the block shall be submitted to and approved by the Engineer before ordering.

c. Brick: The brick units used on this job shall comply to the requirements of ASTM C-216, for face brick, Grade SW, cored or solid. Color and texture shall be approved by the Engineer. Material handling and installation shall conform with the recommendations of the Brick Institute of America (BIA) and the National Concrete Masonry Association.

d. Mortar and Grout: Mortar and masonry units shall be ASTM C 270, Type S, and shall consist of one part portland cement, ½ part of lime putty, and 4 ½ parts of sand. Color of mortar shall be 'Tile Red'.

Water repellant admixtures shall be added to all mortar in the quantity recommended by the Manufacturer. Mortar shall develop a 28-day compressive strength of at least 1800 pounds per square inch. Tests to verify the compressive strength may be required by the Engineer.

All mortar shall be mixed on the job, lime putty may be mixed off the job. Materials for mortar shall be measured by volume. Mortar shall be mixed in a mechanical mixer and only in such quantities as are needed for immediate use. No mortar which has been mixed for more than one hour shall be used. Mortar shall be mixed for five minutes after all materials have been added to the mixer. Grout shall be composed by volume of one part porland cement and two parts sand to which may be added not more than 1/10 part lime. Sufficient water shall be added to produce consistency for pouring without segregation of the constituents of the grout. Grout which is used in grout spaced four-inches or more in both horizontal dimensions may contain an addition of pea gravel equal to not more than two parts by volume of cement used. Such pea gravel shall be graded with not more than five percent passing the No. 8 sieve and 100 percent passing the 3/8 inch sieve. Grout shall develop a strength of at least 1200 pounds per square inch at 28 days. Tests to verify compressive strength may be required by the Engineer.

e. Block Insulation: All exterior blockwalls which have cells that are not filled with grout shall be filled with insulation. The loose-fill masonry insulation shall be perlite or vermiculite conforming to Federal Specification HH-1-574A or HH-1-585 respectively. The cells in block shall be kept as free of mortar as possible as

the masonry goes up. Care shall be taken that no insulation gets into cells which are to be filled with grout and that no grout gets into cells that are to be filled with insulation.

f. Steel Walk-through Doors: All walk-through doors required for the completion of this item shall be insulated metal flush type doors, as manufactured by Overly Manufacturing Company Los, Angles, California; Ceco, San Francisco, California, or approved equal.

Metal doors shall be 1 3/4-inches thick flush type, constructed of two sheets of not less than 16-gauge steel sheets formed and welded for flush pan assembly, with internal 20-gauge vertical reinforcing channels spaced not over 8-inches on centers the full height of the door. Reinforcing channels shall be uniformly spot welded to mated pans. Continuous 18-gauge stiffener channels shall be welded to faceplates at top of exterior doors and also at the bottom of doors with thresholds to provide flush closure. All interior void spaces shall be completely filled with not less than 3-lb density rock wool or polyerethane. There shall be no visible joints on the face of the doors.

Concealed sheet or bar steel reinforcing shall be provided for mortise type hardware. Reinforcing shall be not less than the following: 9-gauge for butts; 12-gauge for locksets; and 14-gauge for surface applied hardware. Reinforcing shall be drilled and tapped to template requirements.

Pressed steel frames shall be constructed of not less than 16-gauge steel and shall be sized as necessary to fit the doors shown on the plans and as required to fit the various wall construction. Frames shall be of welded unit construction, assembled and welded in the shop. Welding shall be to a hairline joint with all exposed beads ground smooth. Jamb regates shall be provided for three gray rubber door silencers. Concealed reinforcing of the frames for mortise hardware shall be not less than the following: 3 1/16-inch for butts; 12-gauge for lock strike; 14-gauge for surface applied items; and 18-gauge plaster guards over mortised hardware reinforcement. Frames shall be mortised, drilled, and tapped to template requirements. Lock reinforcing units shall be supplied by finish hardware supplier. Anchors for door frames in masonry shall be Overly No. 111, or approved equal.

After shop assembly, doors and frames shall be cleaned thoroughly, ground smooth, and all seams along the edges of the door shall be filled flush with mineral filler. All doors and frames shall be bonderized and given one shop coat or rust inhibitive primer.

The finished painting of the metal doors shall be the same as that specified for the exterior structural steel painting set forth in these specifications.

g. Door Hardware

General: Hardware shall be furnished an installed by the door manufacturer. In general, all fasteners shall be Type 302 or 304 stainless steel.

Hinges: Three (3) stainless steel hinges shall be required per steel door. Hinges shall be Mc Kinney Ta 3313, Stanley FBB 199, or approved equal.

Latch Set: Latch set shall be stainless steel. Latch set for exterior doors shall meet Federal Specification FFH-161A locked or unlocked by a key from outside knob and push-button locking from inside. Keys for all exterior doors shall be identical. Latch sets for interior doors shall meet Federal Specification FFH-106A-161N with no locks. Knobs shall be Tulip type with rasp. Latch sets for restroom door shall have an outside push bottom locking device for privacy with an outside emergency lock release mechanism.

h. Windows: All windows in the outside wall shall be triple pane, aluminum frame windows of the sizes and dimensions shown on the drawings, or as approved by the Engineer. Windows will be opened or closed from floor level. Necessary rods and opening devices shall be provided by the contractor. Insect screens will be required on all exterior windows. Interior windows shall be double pane, horizontal sliders with aluminum frames.

i. Roof Covering

Roof covering shall be CO Building Systems “S” or “R” panel, or approved equal, formed from galvanized steel of minimum 26 U.S. gage with not less than 1.250 per sq. ft. of zinc coating.

Material Specification: Materials shall conform to the chemistry requirements of ASTM A446.

Roof and wall panels shall be fastened to framing members with #12 hex head mechanical zinc plated self-tapping, self drilling screws.

Factory coated baked enamel colored roof and wall sheets shall be required. The color will be ‘Tile Red’.

High ribs for the panel shall be spaced 12-inches on center. These ribs for the “S” panel shall be 1 ½-inches in depth, and for the “R” panel 1 1/8-inches in depth. Two secondary ribs shall be located between the major ribs. Roof panels shall be made to overlap one rib. The panels shall provide a net converge of 32".

j. Fixtures and Accessories: All fixtures and accessories shall be roughed in according to dimensions supplied by the manufacturer of the equipment. Each

fixture and waste piping shall be supplied with the equipment. Each fixture and accessory shall be mounted in accordance with the manufacturer's recommendations and without damaging the finished wall or floor surfaces. All plumbing piping shall be concealed unless otherwise indicated. Installation of all fixtures shall comply with the Uniform Plumbing Code.

k. Lavatories: All lavatories shall be vitreous china wall mounted with minimal dimensions, 24-inches long and 20-inches wide. They shall be equipped with self-closing combination metering faucet with vandal proof aerator with perforated strainer. The fixtures shall be provided with a 1 1/4-inch cast brass "P" trap.

l. Water Closet: All water closets shall be floor mounted units constructed of vitreous china having an elongated siphon jet bowl with a 1 ½-inch top spud. The units shall be equipped with suitable flush valves as recommended by the manufacturer.

m. Urinal: When shown on the drawings, the urinal shall be vitreous china wall mounted unit with a 1 ½-inch top spud. The units shall be equipped with I. P.S. outlet connection and a flush valve.

n. Partitions and Doors: When shown on the drawings the doors, partitions and front panels shall be made one-inch thick of two sheets of full cold-rolled stretcher leeled furniture finished steel assembled over and cemented under pressure to a 7/8-inch thick sound deadened fiber core. Sheets shall be of 20 gauge steel.

Posts shall be 2-inch square, hollow-drawn steel in interlock construction. All posts shall be fitted into steel floor shoed securely and expansion bolted to the floor.

Partitions shall be secured to wall be metal brackets. Handrails shall be secured to walls with steel flange.

Door hardware shall include adjustable gravity-type ball bearing hinges, pulls, stop, coat hook, and slide for each latch for each door. Hardware shall be chrome plated.

Painting shall be one prime coat and one enamel finishing coat; both sprayed on with color as approved by the Engineer.

4. **BUILDING CONSTRUCTION**

a. Concrete: All concrete work shall be done in accordance with Specification 32,

Concrete.

b. Structural Metals: The Contractor shall furnish and install all structural steel items in accordance with plans and specification herein. He shall provide all supplementary parts necessary to complete each item even though such work is not definitely covered by the plans and specifications.

Wherever applicable, all fabrication and erection of steel items shall conform to AISC "Specification for the Design, Fabrication, and Erection of Structural Steel for Buildings" except as the same may be modified by applicable building codes, the special conditions, and detailed specification of which this is a part. Where anchors, connections, or other details of miscellaneous metal work are not definitely shown or specified, their material, size form of attachment, and location shall conform to best practice.

Sharp or hazardous projections shall be rounded off and ground smooth.

The Contractor shall take all measurements necessary to properly fit his work in the field, and he shall be governed by and be responsible for these measurements and the proper working out of all details, The Contractor shall be responsible for the correct fitting of all metalwork in the field.

All prefabricated structural or foundry items shall be carefully constructed to true dimensions without warp or twist. Welded closures shall be neatly made; and where weld material interferes with fit or is unsightly in appearance, it shall be ground off smooth.

Each structural item shall be installed true to level, plumb, alignment, and grade, with all parts fitting the structure or equipment for which it is intended accurately and securely. It shall not permitted to cock out of alignment, redrill, reshape, or force to fit any fabricated item. It is the Contractor's responsibility to place anchor bolts or other anchoring devices accurately and to make any surfaces which bear against structural items smooth and true to level to preclude the necessity of any springing, redrilling, or reshaping.

All structural steel shall be delivered free from mill scale, rust, or pitting. Items not galvanized or protected by a shop coat of paint shall be protected from the weather until erection and painting.

The Contractor shall furnish and install all structural aluminum items in accordance with the plans and as specified. He shall provide all supplementary parts necessary to complete each item even though such work is not definitely covered by the plans and specifications. Their size, form, attachment, and location shall be such as to conform to the best of current practice.

Materials not otherwise specified shall conform to the latest applicable specifications of ASTM.

Aluminum shapes and appurtenant materials shall conform to the requirements of ASTM B 221 and ASTM B 308 and shall be of aluminum alloy known commercially as 6061-T6.

Where aluminum comes in contract with steel it shall be bolted with stainless steel bolts and separated or isolated from the steel with neoprene gaskets or as otherwise approved by the Engineer.

Non-structural materials may be heated to a temperature not exceeding 400 degrees F. for a period not exceeding 30 minutes to facilitate bending. Such heating shall be done only when proper temperature controls and supervision are provided to insure that the limitations on temperature and time are carefully observed.

c. Layout: Hole centers may be punched and cutoff lines may be punched or scribed. Center punching and scribing shall not be used where such marks would remain on fabricated material.

A temperature correction shall be applied where necessary in the layout of critical dimensions. The coefficient of expansion shall be taken as 0.000013 per degree Fahrenheit.

d. Cutting: Material ½ inch thick or less may be sheared, cased, or cut with a router. Material more than ½ inch thick shall be sawed or routed.

Cut edges shall be true and smooth, and free from excessive burrs or ragged breaks.

Edges of plates carrying calculated stresses shall be planned to a depth of 1.4 inch, except in the case of sawed or routed edges of a quality equivalent to a planned edge.

Re-entrant cuts shall be avoided wherever possible. If used, they shall be filleted by drilling prior to cutting.

Rivet or bolt holes may be punched or drilled to a finished size before assembly.

The finished diameter of holes for unfinished bolts shall be not more than 1/6 inch larger than the nominal diameter.

All holes shall be cylindrical and perpendicular to the principal surface. Holes

shall not be drifted in such a manner as to distort the metal.

Flame cutting of aluminum alloys is not permitted.

e. Welding: The Contractor shall notify the Engineer at least 24 hours before starting shop or field welding. A welding inspector may check the materials, the equipment, and the qualifications of the welders. Welders doing unsatisfactory work shall be removed or may be required to pass qualification tests again.

The inspector may use gamma ray, magnetic-particle, dye penetrant, trepanning, or any other aid to visual inspection which he may deem necessary to insure himself of the adequacy of the welding.

This specification shall apply to both field and shop welding operations. The general recommendations and regulations shown in the American Welding Society Specifications DI.I, "Structural Welding Code," apply as well to 6062-T6 structures. Detail requirements in the above specifications apply to steel structures. Detail requirements for welding aluminum alloy 6062-T6 are given in the following paragraphs.

Filler metal for welding shall be aluminum alloy welding rods conforming to the requirements of AWS A 5.10 and shall be AWS classification ER 4043, ER 5254, ER 5356, or ER 5556.

All welding of steel under this section shall be done by welders who have a current AWS certificate for the type of welding to be done by the welder. All welding of structural steel type ASTM A 36 shall be done using mild Submerged Arc Welding conforming to ASTM A 558, Classification F70-XXXXX, where XXXXX refers to any electrode referred to in ASTM A 558. Welding of stainless steel shall be done with electrodes and techniques as recommended in Welded Austenitic Chromium - Nickel by the International Nickel Company, Inc. New York, New York. All welds shall be full penetration welds, unless specified otherwise.

Dirt, grease, forming or machining lubricants, or any organic material shall be removed from the areas to be welded by cleaning with a suitable solvent or by vapor degreasing. Additional operations to remove the oxide coating just prior to welding are required when the inert gas tungsten arc welding method is used. This may be done by etching or by scratch brushing. The oxide coating may not need to be removed if the welding is done with the automatic semi-automatic inert gas shielded metal arc.

Suitable edge preparation to assure 100 percent penetration in butt welds shall be used. Oxygen cutting shall not be used. Sawing, chipping, machining, or shearing

may be used.

Any welding of aluminum shall be done using a nonconsumable tungsten electrode with filler metal in an inert gas atmosphere (TIG) or using a consumable filler metal electrode in an inert gas atmosphere (MIG). No welding process that requires the use of a welding flux shall be used unless prior approval has been obtained from the Engineer. Preheating for welding is permissible provided the temperature does not exceed 400 degrees F.for a total time of 30 minutes.

f. Masonry: The foundation on which a masonry wall is to be built shall have a clean surface. Sandblasting shall be done if the surface has laitance or other foreign material lodged in the pores of the foundation surface.

All sills, ledges, offsets and other projections shall be protected from droppings or mortar and all construction by other trades shall be protected from effects of masonry work.

All masonry walls shall be laid in uniform and true courses, level and plumb. Full mortar bedding shall be used for the first course on the foundations. Full mortar coverage shall be provided on all face shells and on the webs surrounding cells to be filled. Vertical head joints shall be buttered well for a thickness equal to the face shell, and these joints shall be shoved tightly so that the mortar bonds well to

both units. Joints shall be solidly filled from the face of the units to the depth of the face shell.

Before starting work, masonry shall be laid dry on the foundation wall and bond adjusted to openings angles, and corners. No lumping of bond will be allowed. All block shall be clean and free of dust, dirt, or other foreign materials from the surface before laying.

Wall shall be plumb within plus or minus ½-inch per 12 feet. Walls shall be straight horizontally within plus or minus l/4-inch in 50-feet. Wall thickness shall be as shown on the Plans with a tolerance of plus 1/4-inch, minus 1/8-inch.

Masonry units shall be laid in the wall to the desired height with joints of uniform thickness. Units shall be leveled, plumbed, and straightened before the mortar has stiffened. Bond shall be plumb throughout.

Block shall be laid in such a way that cracks are not formed at the time they are placed in the wall.

Masonry units shall be adjusted to their final position in the wall while the mortar is still soft and plastic enough to insure a good bond. If the position of the unit is

shifted after the mortar has stiffened, or bond is broken or cracks are formed, the unit shall be relayed in new mortar.

Openings in masonry walls, unless indicated or specified otherwise, shall have lintels made up of like units reinforced and filled solidly to properly span opening.

All masonry shall be laid to preserve the unobstructed vertical continuity of the cells to be filled. Vertical cells to be filled shall have vertical alignment sufficient to maintain a clear, unobstructed continuous vertical cell measuring not less than 2-inches by 3-inches. Walls and cross webs forming such cells to be filled shall be full bedded in mortar to prevent leakage of grout. All head (or end) joints shall be solidly filled with mortar for a distance in from the face of the wall or unit not less than the thickness of the longitudinal face shells.

Vertical reinforcement shall be held in position at top and bottom and at intervals not exceeding 192 diameters of the reinforcement.

All vertical cells containing reinforcement shall be filled solidly with grout in lifts not exceeding 4-feet in height.

When the grouting is stopped for one hour or longer, horizontal construction joints shall be formed by stopping the pour grout 1 ½-inches below the top of uppermost unit .

All items as required and/or directed including all anchors, flashing, sleeves, flames, structural steel, loose lintels, anchor- bolts, miscellaneous iron, arid all other items required shall be built in for a complete job.

Where masonry is to enclose conduits, pipes, stacks, ducts, and similar items, slots, chases, cavities, and similar spaces shall be constructed as required, whether indicated on the Plans or not. No such work shall be covered until advised that work has been inspected and tested.

All necessary cutting of masonry units to form chases, etc., for anchorage or other appurtenances shall be required. All cutting and fitting of exposed masonry units shall be done with a power driven Carborundum or diamond disc blade saw.

Jambs and head of metal door frames connected to masonry shall be anchored and fully grouted. Filling of frames shall be done as each two feet of masonry is laid.

Patching of exposed masonry units shall be done at the conclusion of the general work and shall be done in such a manner that the patching will be indistinguishable from similar surrounding or adjoining work.

Masonry units shall be cured and dried before being used and surface shall be clean and free from dirt when laid in the walls. Masonry units shall not be wetted before being used but shall be laid dry.

All masonry units shall be transported and handled in such a manner as to prevent chipping and breakage, storage piles, stacks, or bins, shall be located to protect materials from heavy traffic. Chipped, cracked, or otherwise defective units shall not be laid in the wall where exposed to view.

Where fresh masonry joints totally or partially set on masonry, the masonry shall be cleaned before laying new work.

Mortar joints shall be straight, clean, and uniform in thickness and shall be a tooled 'V' joint for stacked bond and tooled concave joint for all other masonry work. Joint thickness to be ½-inch both vertical and horizontal unless otherwise shown.

Control joints with filler shall be located as shown on the plans or as specified. Control joints shall be continuous full height of walls. At bond beams control joints shall separate masonry and grout; however, steel reinforcing shall be continuous.

Location and spacing for the required bond beams and control joints shall be as required by the Federal, State and local building codes.

Fill material shall be sponge rubber, 3/8-inch thick.

Temporary protection shall be provided for all exposed masonry corners subject to injury.

Masonry shall be protected against too rapid drying by frequently fogging and sprinkling so that walls will always be visibly wet for a period of not less than 3-days.

At the completion of the work, all holes or defective mortar joints on exposed masonry shall be pointed. Where necessary defective joints shall be cut out and repointed.

All openings in exterior masonry for pipes, conduits, etc., shall be caulked weather tight with synthetic rubber especially formulated for that function.

g. Cold Weather Protection of Masonry: Masonry work to be done when the minimum daily air temperature is 40 degrees Fahrenheit, or less, shall comply with the following requirements: Heat mixing water aggregate to a minimum of

70 degrees Fahrenheit and maximum 160 degrees Fahrenheit. Provide enclosure and heat to maintain air temperature above 32 degrees Fahrenheit. Temperature of masonry units shall be minimum 30 degrees Fahrenheit when laid. Maintain masonry temperature above 32 degrees Fahrenheit for 24 hours by enclosures and supplemental heat.

h. Carpentry: In general, all carpentry and interior finishing work shall be performed in accordance with the best practice known to the trade. All notching, coping, and mitering of meeting members shall be done in such a manner that meeting members shall have full bearing and without over or undercutting.

Sheet rock shall be of the size and placed as shown on the drawings. The panels shall be secured using screws of sufficient length. Seams shall be covered with perfatape and finished to a smooth surface. Insulation shall be of the size and type as shown on the drawings and installed securely in place prior to installation of the sheet rock.

Where nailing is not specified, sufficient nails shall be used to provide strong connection. Unless otherwise specified, nails shall be of such length to penetrate the member being nailed to by not less than the thickness of such member. Box nails shall not be used on any construction.

Plates on top of masonry walls shall be level and in the same plane. Cement grouting shall be used, if necessary, to insure full bedding of plates. Plates shall be anchored to masonry with bolts of the size and spacing shown on the plans, and there shall be an anchor bolt within six (6) inches of the end of each member. Where plate members abut, but do not match level, they shall be planed to the same level.

i. Electrical: All electrical work must comply with the applicable building codes.

j. Pipe Work: All pipe work shall comply with the applicable building codes.

5. PAINTING

All paint materials specified by name, brand, or manufacturer, or selected for use under these specifications, shall be delivered unopened at the job site in their original containers bearing the manufacturers label. No paint other than that specified or approved shall be stored or kept at the job site. No lead paints shall be used.

All paint for concrete and metal surfaces shall be especially adapted for use in moist conditions and shall be applied in conformance with the manufacturer‘s published specifications.

Complete data on each type and kind of paint and primer shall be submitted to the Engineer for approval. Approval shall be received from the Engineer before the paint is delivered to the job site. The instructions must have been written and published by the manufacture for the purpose and with the intent of giving complete instruction for the use and application of the proposed paint in the locality and for the conditions for which the paint is specified or shown to be applied under this contract.

All limitations, precautions, and requirements that may adversely affect the paint that may cause unsatisfactory results after the painting application; or that may cause the paint not to serve the purpose for which it was intended, that is, to protect the covered material from corrosion, shall be clearly and completely stated in the instructions. These requirements shall include the following list:

Method of application
Number of coats
Thickness of each coat
Total thickness
Drying time of each coat, including primer required to be used
Primers not permitted
Use of a primer
Temperature limitations during application and after application
Protection from sun
Physical properties of paint including solids content.

The Contractor shall prepare and submit sample colors for al items which require color selection by the Engineer. No color selection will be made until all samples of all paints have been submitted. After all samples of all paints have been submitted, the Engineer will prepare a color scheme using the submitted colors.

Colors will not necessarily be standard colors with all suppliers, and colors shall be mixed by the manufacturer to secure desired color when not standard.

Date submitted on each proposed type and kind of paint shall include data to show that the paint meets the detailed requirements of these specifications.

At the end of the project the Contractor shall turn over to the Engineer a gallon can of each type and color of paint, primer, thinner or other coating used in the field painting. If the manufacturer packages the material concerned in gallon can, then it shall be delivered in unopened labeled cans as it comes from the factory. If the manufacturer does not package the material in gallon cans, and in the case of special colors, the materials shall be delivered in new gallon container, properly closed with typed labels indicating brand, type, color, etc. The manufacturer's literature describing the materials and giving directions for their use shall be furnished in three bond copies. A type written inventory list shall be furnished at the time of delivery.

No thinning of paint other than as directed by the manufacture's published directions shall be done without the approval of the Engineer. No painting shall be done under conditions which, in the opinion of the Engineer, will jeopardize the appearance or quality of the painting in any way.

Upon completion of the painting, the Contractor shall remove all surplus materials and rubbish and remove spattered paint from hardware, floors, glass, walls, equipment, and any other surfaces upon which it is not intended to be.

Except as otherwise provided in these specifications or approved in writing by the Engineer, undercoats, prime coats, and finish coats on any one item shall be of the same manufacturer. If the incorrect prime coat is applied for any reason, it shall be sandblasted off and replaced with the specified primer.

6. SURFACE PREPARATION

All surfaces to be painted shall be clean and dry except that in some cases the paint manufacturer's directions may require wetting the surface before painting.

Except as otherwise provided, all preparation of metal surfaces shall be in accordance with Specification SP-1 through SP-10 of the Steel Structures Painting Council (SSPC). Grease and oil shall be removed by wiping with mineral spirits or naphtha per Specification SP-1. Rust, scale, welding slag, and spatter shall be removed and the surface prepared by hand tool cleaning, power tool cleaning, or blast cleaning in accordance with the Appropriate Specification SP-1 through SP-10.

Unless otherwise specified, all iron or steel surfaces which are to be painted as submerged metal shall be dry sandblasted on the site, near white blast cleaning. Except as otherwise specified, all material surfaces which are to be painted as unsubmerged metal shall be commercial blast cleaned per Specification SP-6. This sandblasting shall be done not more than 12 hours ahead of the painting, subject to humidity and weather conditions between the time of sandblasting and painting operations. If any rusting of sandblasted surfaces occurs before painting, such rusting shall be removed by additional sandblasting. No surface which is to be sandblasted shall be given a coat of primer or paint in the shop or in the field before sandblasting.

Threaded portions of valve and gate stems, machined surfaces which are intended for sliding contact, surfaces which are to be assembles against gaskets, surfaces of shafting on which sprockets are to fit, or which are intended to fit into bearings, machined surfaces of bronze trim on slide gates and similar surfaces shall be masked off to protect them from the sandblasting of adjacent surfaces.

There will be some surfaces which cannot be sandblasted, or which cannot be sandblasted and painted, after the items of which they are a part have been assembled in

final position. These surfaces shall be sandblasted, or sandblasted and painted, before the items are put into final position. In some cases while the painting could be done after the items concerned were in place, the limitation on time between sandblasting and painting may make it necessary to paint the surfaces before installation of the items concerned.

Sand from sandblasting shall be thoroughly removed, using a vacuum cleaner if necessary.

In the event shop sandblasting is selected by the Contractor for prefabricated sections, the primer coat shall be applied prior to shipping to the job site. The primer coat will be in accordance to these Specifications.

Concrete surfaces specified to be acid etched shall be etched with a 15 to 20 percent solution of muriatic or sulfamic acid until the surface has the texture of fine sandpaper. The surface shall the be thoroughly scrubbed with clean water, rinsed, and allowed to dry.

Concrete and masonry surfaces shall be free of dust, mortar droppings and spatter, fins loose concrete particles, form release materials, oils, grease, and other deleterious materials. If required by the coating manufacturer, such surfaces shall be etched as specified above or brush off blast cleaned per Specification SP-7.

All painted surfaces shall be dusted between coats and high gloss finished shall be lightly sanded and dusted between coats unless otherwise directed by the manufacturer.

7. PAINT APPLICATION

The applicator of the paint shall have had past experience in applying the type of types of coatings and under similar conditions that he will be required to meet in this Contract. The Contractor shall verify the paint applicator's qualifications before subcontracting the work to him.

No painting shall be done under dusty conditions, during or immediately after a rain, during rainy weather, or when the temperature is less than 50 degrees Fahrenheit.

Except that prime coats shall be applied by brush and well worked into the surface, paint may be applied by brush, roller, trowel, or spray, unless the manufacturer's recommendations or these Specifications call for some particular type of application. Where spray application is used, each coat of paint shall be applied to a thickness equivalent to a brush coat application at a coverage not greater than that specified by the manufacturer for a brush coat application. All air spray painting units shall be equipped with adequate line filters. Units without line filters will not allowed on the jobsite.

All work shall be done in a workmanlike manner, leaving the finished surfaces free from

drops, ridges, waves, holidays, laps, or brush marks. Drop cloths and other covering shall be placed at all time as to protect floors and other surfaces from spatter and droppings. Hardware, plates, lighting fixtures, nameplates, and similar articles which are to be painted shall be masked off or removed completely. After completion of painting, all spatter or droppings shall be removed.

Primer and intermediate coats of paint shall be unscarred and completely integral at the time of application of each succeeding coat. Each coat shall be subject to the inspection and approval of the Engineer before the next succeeding coat is applied, and defective work of any kind shall be deemed sufficient cause for re-coating the entire surface involved.

Sufficient time shall be allowed between coats to insure proper drying unless these specifications or manufacturer's recommendations specifically state otherwise. Excessive time or exposure between coats shall not occur in cases where such excessive time or exposure will impair the bond between coats.

8. INTERIOR BLOCK AND CONCRETE SURFACES

Masonry walls shall be filled in order to provide a smooth base before paint application. When called for in Section 5-14 or shown on the drawing, the interior masonry and concrete walls and concrete floor surfaces shall be painted with two coats of semi-gloss latex enamel area primer recommended by the manufacturer to a total dry film thickness of not less then 4.5 mils.

Finish coats shall contain not less than 29 percent solids by volume. Paint systems shall be as follows, or approved equal, of colors specified, or as directed by the Engineer.

Monile: Two coats of PVA Emulsions Series 31, over PVA Wall Primer 77-W-1 applied to surface prepared in accordance with the manufacturer's directions, or
Sherwin-Williams: Two coats of HI-Hide Latex Semi-Gloss Enamel Series B40 over Metaletex B42 W 100.

9. EXTERIOR BLOCK SURFACES

Masonry, concrete, and plaster surfaces exposed to view outside the building shall be painted with two coats of exterior acrylic emulsion finish, over one coat of primer or sealer as recommended by the manufacturer. Color shall be as directed by the Engineer. Unless otherwise indicated, porous block shall be filled to provide a smooth base, Sherwin-Williams Bloc-Tex, Glidden Tiller Block Sealer No. 1953, or approved equal shall be used to fill porous block.

Form release agents shall be removed from poured or precast surfaces by solvent wash or by sand blasting as recommended by the manufacturer.

Acrylic emulsion finish shall contain not less than 30 percent pigment by weight, 30 percent solids by volume and shall be applied to a total dry film thickness, including primer, of not less than 4.5 mils.

Metal pipe may be vinyl coated as follows or by approved equal system after power tool cleaning, SP-3. Apply one coat of Engard 350 Vinyl Primer followed by one coat of Engard 362 Vinyl or treat with Koppers 40 Passivator followed by one coat of Rigortex 3305 Intermediate and one coat of Rigortex 3305 finish coat. Total dry film thickness shall be not less than 4 mils.

10. EXPOSED METAL SURFACES

Doors, ventilators, flashing, and other exposed metal, structural or non-structural, shall be painted as specified for concrete and masonry surfaces except that surface preparation and primer shall be appropriate to the substrate and as recommended by the coating manufacturer. Color shall be as specified or as directed by the Engineer.

11. ITEMS OF WORK AND CONSTRUCTION DETAILS

a. Bid Item 1, Entrance Stataion Building

1. This item shall consist of furnishing and installing the entrance station building as shown on the drawings, including all materials, labor, tools, equipment, and services necessary to construct the building, complete as shown on the drawings and as called for in these specifications. This shall include the furnishing and installing of the foam block, restroom facilities, office, windows, doors, roofing, ceiling, painting, vents, and all other items incidental to the construction of the building.

2. The Contractor shall furnish and install the foam block to construct the building. The block shall be “ARXX Building Products, 6" Form”. Contractor shall follow the requirements of the manufacturer and complete the building in a workmanlike manner.

3. The excavation required for the building footings shall be in accordance with Specification No. 21 and shall be subsidiary to this bid item.

4. The work and materials required for the concrete floors, pads and footings, shall conform to the requirements of Specification No.31 and shall include the reinforcing steel, Grade 60, as shown on the plans. Payment shall be made and shall be subsidiary to this bid item.

5. The work and materials required for the interior plumbing, water and sewer, shall be subsidiary to this bid item. All work and materials shall be

ADA compliant. The plumbing fixtures shall be the following or and approved equal:

Toilets - Model: American Standard Flowise 1.28 elongated toilet.
Sink Model: Crane Plumbing 1412H1BNC (white color)
Sink Fixtures: Crane Plumbing

6. The work and materials required for the electrical appliances and wiring shall conform to the current building codes. This item shall include electric heater and air conditioner in one unit. Model AMANA PTC153B35 AK 42-inch PTAC digital control. Air conditioner shall be w/14,000/13,900 cooling BTU, 230/208 volts, 9.5 EER, LED display.

7. The electric water heater shall be 5/8 gallon Model, "Quick & Hot AH-780-UL. The water tank shall be a pressure booster, 20 gal., Model: Tank Depot WPBS-Deluxe. The pressure booster tank will be connected to the water tank as shown.

8. The interior walls of the building shall be finished with 1/2-inch dry wall board. Paint shall be required as shown on the drawings.

9. The interior walls of the restrooms shall be finished with floor ceramic tile, Armstrong Atkins 6"x 6", 4-ft high with green wall the remaining height. Color shall be as noted on the drawings.

10. The interior floor will be covered with ceramic tile, Armstrong Atkins 13" x 18" Cat001313. Color shall be as noted on the drawings. Exterior wall will receive a rock facing as shown on the drawings. Rock will be mined at the site at a location approved by the Owner.

11. Roof covering shall be 24 gauge galvanized steel with baked enamel color. Type McElroy metal - Mirage (Autumn Red) and shall be structured using 5/8" OSB and 30# asphalt roofing.

12. Standard formed ridge cap shall be formed to match the roof slope and shall be of the same material, color and configuration as the roof panels.

13. Eave gutters and down spouts shall be 26 gauge galvanized steel. All splices shall be riveted and caulked to prevent leakage, Model GAK205XG26X.

14. The doors will be furnished and installed as shown on the drawings. All doors shall be equipped with ADA approved Corbin PZD locksets or an

equal, approved by the Engineer. Keys shall be labeled “Do Not Duplicate”. Locksets shall be lockable only by a key.

15. All windows shall be the size and model as shown on the drawings.

16. Contractor will furnish all labor, materials, equipment and services necessary to complete all electrical work. Electrical wiring will be furnished and installed according to the prevailing codes. All wiring will be placed in conduit, PVC, Schedule 40. Square D breaker box, 100 amp, 20 spaces will be required.

17. Contractor will furnish and install the lighting system as detailed in the drawings and called for in these specifications. Outdoor lights will be furnished and installed by the Contractor. The lights will be Model RAB #RABVBF13 Polycarbonate Globe entry light. 13 watt with a dusk to dawn photo-cell. Interior lights will be a standard flourescent 2-bulb, 48-inch, located a shown on the drawings. Outlets and switches located as shown on the drawings. The Contractor shall be responsible for providing all electrical work and materials necessary to make the building operational in accordance with the plans and specifications.

18. Counter and drawers will be furnished and installed by the Contractor as shown on the plans. Counter top shall be Formica with a 4-inch back-splash.

19. A water cistern is required. It shall be a 1,700 gallon underground tank, Model: Plastic-mart, 1700CisTPKG. The tank will be located as shown on the drawings. The 2-inch PE pipe, Class 200, shall be encased in the 4-inch PVC pipe as shown. The PE pipe shall conform to requirements of ASTM D 1248, Type III, Class C-Black. All materials shall be NSF approved.

20. A septic tank and drain field is required as shown on the drawings. The tank will be a 1000 gallon “Dura Crete” tank. 4-inch perforated drain pipe shall be placed in drain rock as shown on the drawings.

21. The work will not be measured. Payment shall be at the contract lump sum price for Bid Item 1, Entrance Station Building. Such payment will constitute full compensation for furnishing, transporting, and constructing this item complete in place as shown on the construction drawings and detailed in this specification.

CONSTRUCTION SPECIFICATION

8. MOBILIZATION

1. **SCOPE**

The work shall consist of mobilization of the Contractor's forces, equipment, construction signing and as detailed in Section 3, and necessary for performing the work required under the contract.

It shall include the purchase of contract bonds, insurances, transportation of the personnel, equipment, and operating supplies to the site; establishing of office, buildings, construction signing in accordance with the manual on "Uniform Traffic Control Device", and other necessary facilities at the site; and other preparatory work at the site.

It shall not include mobilization for any specific time of work for which payment for mobilization is provided elsewhere in the contract.

This specification covers mobilization of work required by the contract at the time of award. If additional mobilization costs are incurred during performance of the contract as a result of change or added items of work for which the Contractor is entitled to an adjustment in contract price, compensation for such costs will be included in the price adjustment for the items of work changed or added.

2. **PAYMENT**

Payment will be made as the work proceeds, after presentation of invoices by the contractor shown his own mobilizations costs and evidence of the charges of suppliers, subcontractors, and others for mobilization work performed by them. If the total of such payments is less than the contract lump sum for mobilization, the unpaid balance will be included in the final contract payment. Total payment will be the lump sum contract price for mobilization, regardless of actual cost to the Contractor.

Payment will not be made under this item for the purchase costs of materials having a residual value, the purchase costs of materials to be incorporated into the project, or the purchase costs of operating supplies.

Payment of the lump sum contract price for mobilization will constitute full compensation for all labor, materials, equipment, and all other items necessary and incidental to completion of the work.

Compensation for any item of work described in the contract but not listed on the bid schedule will be included in the payment for the item or work to which it is made subsidiary. Such items and the items to which they are made subsidiary in Section 3 of this specification.

3. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and the construction details are:

a. Bid Item 2- Mobilization

1. This item shall consist of the contract bonds, insurance, UP&L connection fee, construction signing, and mobilization of the Contractor's forces and equipment, as defined in Section 1, required for performing the work under this contract.

2. Contractor will include in this Bid Item a $10,000 connection fee, required by UP&L for power service. Said fee will be paid by the Contractor to UP&L at the Moab Office within 2 days after receiving a Notice of Award.

3 Payment will be made in accordance with Section 2.

CONSTRUCTION SPECIFICATIONS

9. EXCAVATION AND BACKFILL FOR PIPELINES

1. SCOPE

This section covers the requirements for trenching and backfilling for underground pipelines.

2. CONTROL OF GROUND WATER

All trenches shall be kept free from water during excavation, fine grading, pipe laying, jointing, and embedment operations. Where the trench bottom is wet or otherwise unstable because of the presence of ground water, and in cases where the static ground water elevation is above the bottom of any trench or bell excavation, such ground water shall be lowered to the extent necessary to keep the trench free from water and the trench bottom stable when the work within the trench is in progress. Surface water shall be prevented from entering trenches. Discharge from trench dewatering pumps shall be conducted to natural drainage channels, or other approved site.

3. EXCAVATION FOR PIPELINES

The trench shall be excavated to the required alignment depth and width to accommodate the construction of the pipelines. Excavation shall be in conformance with all Federal, State and Local regulations for the safety and protection of the workmen.

a. When rock, stones, cobble rock, concrete, masonry or other unsatisfactory material is encountered in the excavation, it shall be removed to provide a clearance of at least 6 inches below and on each side of all pipe. When excavation is completed, a bedding of sand, screened stone, or earth that is free from stones, large clods, or frozen earth, shall be placed on the bottom of the trench to the required depths, leveled, and tamped.

   The specific clearances shall be maintained between the bottom of all pipe and appurtenances and any part, projection, or point of rock, boulder, or stones or sufficient size and placement which, in the opinion of the inspector, could cause a fulcrum point.

b. Where unstable earth is encountered in the excavation at the grade of the pipe, a minimum of six inches below grade will be removed and backfilled with crushed rock or gravel to provide a stable subgrade.

4. **BLASTING**

Blasting will not be allowed except by permission from the Engineer. The Contractor shall comply with all laws, ordinances, and applicable safety code requirements and regulations relative to the handling, storage, and use of explosives and protection of life and property, and he shall be fully responsible for all damage attributable to his blasting operations. Excessive blasting or overshooting will not be permitted and any material outside the authorized cross-section which may be shattered or loosened by blasting will be removed by the Contractor at no extra cost.

5. **SHEETING, BRACING & SHORING OF EXCAVATIONS**

Excavation shall be sheeted, braced, and shored as required to support the walls of the excavations to eliminate sliding and settling and as may be required to protect the workmen, the work in progress and existing utilities and improvements. All such sheeting, bracing and shoring shall comply with the requirements of the Utah State Industrial Commission.

All damage resulting from lack of adequate sheeting, bracing and shoring will be the responsibility of the Contractor. The Contractor shall effect all necessary repairs or reconstruction resulting from such damages.

6. **BEDDING**

The pipe shall be firmly and uniformly bedded through its entire length and to a depth of 6 inches above the pipe and in the manner as shown on the drawings. The bedding material shall be free of any rock larger than 1-inch. Material shall be worked around the haunches of the pipe to fill all voids and provide firm, uniform support. Wherever the subgrade material does not afford a sufficiently solid foundation to support the pipe and superimposed load and where water must be drained to maintain a dry bottom for pipe installation and at other locations as shown on the plans, the subgrade shall be excavated to the specified depth and replaced with gravel bedding.

It will be placed so as to prevent segregation and as shown on the drawings. The gravel bedding shall meet the following sieve requirements:

US Sieve Size or Number	% Passing
2”	100
1 ½”	95-100
¾”	35-70
3/8”	10-30

No.4 0-5

7. BACKFILLING

Backfilling shall be carefully placed around and over pipes and shall not be permitted to fall directly on a pipe from such a height or in such a manner as to cause damage. In these specifications, the process of preparing the trench bottom to receive the pipe and the backfilling on the pipe to a level 12 inches over the top of the pipe is defined as Bedding. Bedding requirements are as defined in the specifications for each specific pipe material.

Trench backfilling above the level of the pipe bedding shall normally be accomplished with native excavated materials and shall be free from rocks larger than six inches in diameter.

The backfill in all utility trenches shall be either compacted or water consolidated to the requirements specified for the materials being placed. Under pavements, or other surface improvements, the in-place density shall be a minimum of 95% percent of laboratory standard maximum dry density as determined by AASHTO T-180. In shoulders and other areas, the in-place density shall be a minimum of 90 percent of the maximum dry density as determined by the same test.

8. CONSOLIDATION OF BACKFILL

Consolidation of backfill shall be accomplished by those methods in which water is used as the essential agent to produce the desired condition of density and stability. Water shall be applied by jetting unless flooding is specifically authorized by the Engineer. Authorization by the Engineer to use any consolidation method does not relieve the Contractor of responsibility to meet the specified density requirements. Water for consolidation shall be furnished by the Contractor at his expense.

All precautions necessary shall be taken by the Contractor to prevent damage and movement (including floating) of the pipeline, structures and existing adjacent improvements and utilities. The allowance of the use of consolidation methods shall not be construed as guaranteeing or implying that the use of such methods will not result in damage to adjacent ground. The Contractor shall make his own determination in this regard, and shall assume all risks and liability for settlement of lateral movement of adjacent ground, or improvements, or utilities, either on the surface of the ground or underground.

9. COMPACTION OF BACKFILL

Backfill shall be compacted by means of pneumatic tire rollers, vibrating rollers, or other mechanical tampers of a size and type approved by the Engineer.

Where compaction methods are used, the material shall be placed at a moisture content such that after compaction the required relative densities will be produced; also the material shall be placed in lifts which, prior to the compaction, shall not exceed 9 inches.

Prior to compaction, each layer shall be evenly spread, moistened, and worked by disk harrowing or other means approved by the Engineer.

If the required relative density is not attained, test sections will be required to determine any adjustments in compacting equipment, thickness of layers, moisture content and compactive effort necessary to attain the specified minimum relative density.

Approval of equipment, thickness of layers, moisture content and compactive effort shall not be deemed to relieve the Contractor or the responsibility for attaining the specified minimum relative densities. The Contractor, in planning his work, shall allow sufficient time to perform the work connected with the test sections, and to permit the Engineer to make tests for relative densities.

All relative density tests shall be made by the Owner at no expense to the Contractor.

10. USE OF EXCAVATED MATERIALS

Method 1

To the extent they are needed, all suitable materials from the specified excavations shall be used in the construction of required permanent earth fill or rock fill. The suitability of materials for specific purposes will be determined by the Engineer. The Contractor shall not waste or otherwise dispose of suitable excavated materials.

Method 2

Suitable materials from the specified excavations may be used in the construction of required earth fill or rock fill. The suitability of materials for specific purposes will be determined by the Engineer.

11. RESTORATION OF FACILITIES AND REMOVAL OF EXCESS MATERIALS

All excess materials shall be hauled away from the construction site and disposed of by the Contractor.

Trees, shrubs, and fences, and all other property and surface structures shall be protected during construction unless their removal is shown in the plans and specifications or approved by the Engineer.
All properties that have been disturbed shall be restored as nearly as practical to their original condition. This includes pavement, road surface, concrete, sidewalks, curb and gutter, etc.

12. STRUCTURE AND TRENCH EXCAVATION

Structure or trench excavations shall be completed to the specified elevations and to sufficient length and width to include allowance for forms, bracing and supports, as necessary, before any concrete or earthfill is placed or any piles are driven within the limits of the excavation.

13. BORROW EXCAVATION

When the quantities or suitable materials obtained from specified excavations are insufficient to construct the specified fills, additional materials shall be obtained from the designated borrow area. The extent and depth of borrow pits within the limits of the designated borrow areas will be as directed by the Engineer.

Borrow pits shall be excavated and finally dressed in a manner to eliminate steep or unstable side slopes or other hazardous or unsightly conditions.

14. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in accordance with these specifications and construction details are:

a. Subsidiary Item, Pipeline Excavation and Backfill

1. This specification is subsidiary to all bid items which required excavation and backfill for pipelines.

2. Compacted fill requirements called for on the drawings will be 95% of test procedure ASTM 1557, Method D. Moisture content shall be within 2% of optimum.

3. All trenches will be compacted.

4. No excavated material shall be stockpiled on public roads without proper signing and warning barricades.

5. Excavated material will be used as trench backfill as described in Method 1.

CONSTRUCTION SPECIFICATION

24. DRAIN FILL

1. SCOPE

The work shall consist of furnishing, placing and compacting drain fill required in the construction of structure drains and filters.

2. MATERIALS

(Method 1) Drains fill materials shall conform to the requirements of Section 8, Items of Work and Construction Details. At least 30 days prior to delivery of the materials to the site the Contractor shall inform the Contracting Officer in writing of the source from which he intends to obtain them. The Contractor shall provide the Engineer free access to the source for the purpose of obtaining samples for testing.

(Method 2) Drain fill materials shall be sand, gravel, or crushed stone or mixtures thereof obtained from the specified sources. They shall be selected as necessary to avoid the inclusion of organic matter, clay balls, excessive fine particles or other substances that would interfere with their free-draining properties.

3. BASE PREPARATION

Foundation surfaces and trenches shall be clean and free of organic matter, loose soil, foreign substances, and standing water when the drain fill is placed. Earth surfaces upon or against which drain fill will be placed shall not be scarified.

4. PLACEMENT

Drain fill shall not be placed until the subgrade has been inspected and approved by the Engineer. Drain fill shall not be placed over or around pipe or drain tile until the installation of the pipe or tile has been inspected and approved.

Drain fill shall be placed uniformly in layers not more than 12 inches deep before compaction. When compaction is accomplished by manually controlled equipment, the layers shall be not more than 8 inches deep. The material shall be placed in a manner to avoid segregation of particle sizes and to insure the continuity and integrity of all zones. No foreign materials shall be allowed to become intermixed with or otherwise contaminate the drain fill.

Traffic shall not be allowed to cross over drains at random. Equipment crossovers shall be maintained, and the number and location of such crossovers shall be established and approved prior to the beginning of drain fill placement. Each cross over shall be cleaned of

all contaminating materials and will be inspected and approved by the Engineer before additional drain fill is placed.

Any damage to the foundation surface or to the sides or bottoms of trenches occurring during placement of drain fill shall be repaired before drain fill placement is continued.

The upper surface of drain fill constructed concurrently with adjacent zones of earth fill shall be maintained at an elevation at least one foot above the upper surface of the adjacent fill.

Drain fill over or around pipe or drain tile shall be placed in a manner to avoid any displacement of the pipe or tile in line or grade.

5. CONTROL OF MOISTURE

The moisture content of drain fill materials shall be controlled as specified in Section 8. When the addition of water is required, it shall be applied in such a way as to avoid excessive wetting of adjacent earth fill. Except as specified in Section, control of the moisture content will not be required.

6. COMPACTION

Drain fill shall be compacted according to the following requirements for the class of compaction specified:

Class A Compaction. Each layer of drain fill shall be compacted to a relative density of not less than 70 percent as determined by ASTM Method D 2049-64T.

Class I Compaction. Each layer of drain fill shall be compacted by at least 2 passes, over the entire surface, of a steel-drum vibrating roller weighing not less than 5 tons and exerting a vertical vibrating force of not less than 20,000 pounds at least 1200 times per minute, or by an approved equivalent method.

Class II Compaction. Each layer of drain fill shall be compacted by one of the following methods or by an approved equivalent method:

a. At least 2 passes, over the entire surface, of a pneumatic-tired roller exerting a pressure of not less than 75 pounds per square inch.

b. At least 4 passes, over the entire surface, of the track of a crawler-type tractor weighing not less than 20 tons.

c. Controlled movement of the hauling equipment so that the entire surface is traversed by not less than one tread track of the loaded equipment.

Class III Compaction. No compaction will be required beyond that resulting from the placing and spreading operations.

When compaction other than Class II compaction is specified materials placed in trenches or other locations inaccessible to heavy equipment shall be compacted by means of manually controlled pneumatic or vibrating tampers or by approved equivalent methods.

7. MEASUREMENT AND PAYMENT

For items of work for which specific unit prices are established in the contract, the volume of drain fill within the neat lines shown on the drawings or limits established by the Engineer will be measured and computed to the nearest cubic yard. Where the Engineer directs placement of drain fill outside the neat lines to replace unsuitable foundation material, the volume of such drain fill will be included, but only to the extent that the unsuitable condition is not a result of the Contractor's operations.

Payment for drain fill will be made at the contract unit price for each type of drain fill, complete in place. Except as otherwise specified in Section 8, such payment will constitute full compensation for all labor, materials, equipment and all other items necessary and incidental to the performance of the work.

Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 8 of this specification.

8. ITEMS OF WORK AND CONSTRUCTION DETAIL

Items of work to be performed in conformance with this specification and the construction details are:

a. Subsidiary Item, 2-inch Drain Rock

1. This item shall consist of furnishing and placing the drain fill around the perforated pipe which form the leach field as shown on the plans or as directed by the Engineer.

2. Method 1 of "materials" will apply. The drain fill shall conform to the gradation requirements of AASHTO M43, size #357. This requirement is as follows:

Size	% Passing

2"	100
1 ½"	95-100
3/4"	35-70
3/8"	10-30
#4	0-5

3. The source of rock will be approved by the Engineer and shall not contain any soft sandstone which will break down during construction.

4. Measurement will not be made. The cost of furnishing and installing the drain rock will be subsidiary to Bid Item #1.

CONSTRUCTION SPECIFICATION

32. CONCRETE FOR MINOR STRUCTURES

1. SCOPE

The work shall consist of furnishing, forming, placing, finishing and curing portland cement concrete as required to build the structure named in Section 24 of this Specification.

2. MATERIALS

Portland cement shall conform to the requirements of ASTM Specification C-150 for the specified type.

Aggregates shall conform to the requirements of ASTM Specification C-33 unless otherwise specified. The grading of coarse aggregates shall be as specified in Section 24.

Water shall be clean and free from injurious amounts of oil, salt, acid, alkali, organic matter or other deleterious substances.

Performed expansion joint filler shall conform to the requirements of ASTM Specification D 1752.

Waterstops shall conform to the requirements of the applicable ASTM specification for the specified kinds.

3. CLASS OF CONCRETE

Concrete for minor structure shall be classified as follows:

Class of Concrete	Maximum Water Content (gallons/bag)	Minimum Cement Content (bags/cu.yd.)
4000	7	6

4. AIR CONTENT AND CONSISTENCY

Unless otherwise specified, the slump shall be 2 to 4 inches. If air entrainment is specified, the air content by volume shall be 5 to 8 percent of the volume of the concrete. When specified or when directed by the Engineer, a water-reducing, set-retarding admixture approved by the Engineer shall be used.

5. DESIGN OF THE CONCRETE MIX

The proportions of the aggregates shall be such as to produce a concrete mixture that will work readily into the corners and angles of the forms and around reinforcement when consolidated, but will not segregate or exude free water during consolidation.

Prior to placement of concrete, the Contractor shall furnish the Engineer, for approval, a statement of the materials and mix proportions (including admixtures, if any) he intends to use. The statement shall include evidence satisfactory to the Engineer that the materials and proportions will produce concrete conforming to this specification. The materials and proportions so stated shall constitute the "job mix." After a job mix has been approved, neither the source, character or grading of the aggregates nor the type or brand of cement or admixture shall be changed without prior notice to the Engineer. If such changes are necessary, no concrete containing such new or altered materials shall be placed until the Engineer has approved a revised job mix.

6 INSPECTION AND TESTING

The Engineer will have free entry to the plant and equipment furnishing concrete under the contract. Proper facilities shall be provided for the Engineer to inspect materials, equipment and processes and to obtain samples of the concrete. All tests and inspections will be conducted so as not to interfere unnecessarily with manufacture and delivery of the concrete.

7. HANDLING AND MEASUREMENT OF MATERIALS

Materials shall be stockpiled and batched by methods that shall prevent segregation or contamination of aggregates and insure accurate proportioning of the ingredients of the mix.

Cement shall be measured by weight or in bags of 94 pounds each. When cement is measured in bags, no fraction of a bag shall be used unless weighed.

Aggregates shall be measured by weight. Mix proportions shall be based on saturated, surface-dry weights. The batch weight of each aggregate shall be the required saturated, surface- dry weight plus the weight of surface moisture it contains.

Water shall be measured, by volume or by weight, to an accuracy within one percent of the total quantity of water required for the batch.

Admixtures shall be measured within a limit of accuracy of three percent.

8. MIXERS AND MIXING

Concrete shall be uniform and thoroughly mixed when delivered to the work. Variations in slump of more than 1 inch within a batch will be considered evidence of inadequate mixing and shall be corrected by increasing mixing time or other means.

For stationary mixers, the mixing item after all cement and aggregates are in the mixer drum shall not be less than 1 ½ minutes. When concrete is mixed in a truck mixer, the number of revolutions of the drum or blades at mixing speed shall be not less than 70 nor more than 100

No mixing water in excess of the amount called for by the job mix shall be added to the concrete during mixing or hauling or after arrival at the delivery point.

9. FORMS

Forms shall be of wood, plywood, steel or other approved material and shall be mortar tight. The forms and associated false work shall be substantial and unyielding and shall be constructed so that the finished concrete will conform to the specified dimensions and contours. Form surfaces shall be smooth and free from holes, dents, sags or other irregularities. Forms shall be coated with a nonstaining form oil before being set into place.

Metal ties or anchorages within the forms shall be equipped with cones, she-bolts or other devices that permit their removal to a depth of at least one inch without injury to the concrete. Ties designed to break off below the surface of the concrete shall not be used without cones.

All edges that will be exposed to view when the structure is completed shall be chamfered, unless finished with molding tools as specified in Section 18.

10. PREPARATION OF FORMS AND SUBGRADE

Prior to placement of concrete the forms and subgrade shall be free of chips, sawdust debris, water, ice, snow, extraneous oil, mortar, or other harmful substances or coatings.

Any oil on the reinforcing steel or other surfaces required to be bonded to the concrete shall be removed. Rock surfaces shall be cleaned by air-water cutting, wet sandblasting or wire brush scrubbing, as necessary, and shall be wetted immediately prior to placement of concrete. Earth surfaces shall be firm and damp. Placement of concrete on mud, dried earth or uncompacted fill frozen subgrade will not be permitted.

Unless otherwise specified, when concrete is to be placed over drain fill, the contact surface of the drain fill shall be covered with a layer of asphalt-impregnated building paper or polyvinyl sheeting prior to placement of the concrete. Forms for weepholes shall extend through this layer into the drain fill.
Items to be embedded in the concrete shall be positioned accurately and anchored firmly.

Weepholes in walls or slabs shall be formed with nonferrous materials.

11. CONVEYING

Concrete shall be delivered to the site and discharged into the forms within 1 ½ hours after the introduction of the cement to the aggregates. In hot weather or under conditions contributing to quick stiffening of the concrete, the time between the introduction of the cement to the aggregates and discharge shall not exceed 45 minutes. The Engineer may allow a longer time, provided the setting time of the concrete is increased a corresponding amount by the addition of an approved set-retarding admixture. In any case, concrete shall be conveyed from the mixer to the forms as rapidly as practicable by methods that will prevent segregation of the aggregates or loss of mortar. Concrete shall not be dropped more than five feet vertically unless suitable equipment is used to prevent segregation.

12. PLACING

Concrete shall not be placed until the subgrade, forms and steel reinforcement have been inspected and approved. No concrete shall be placed except in the presence of the Engineer. The Contractor shall give reasonable notice to the Engineer each time he intends to place concrete. Such notice shall be far enough in advance to give the Engineer adequate time to inspect the subgrade, forms, steel reinforcement and other preparations for compliance with the specifications before concrete is delivered for placing.

The concrete shall be deposited as closely as possible to its final position in the forms and shall be worked into the corners and angles of the forms and around all reinforcement and embedded items in a manner to prevent segregation of aggregates or excessive laitance. Unless otherwise specified, slab concrete shall be placed to design thickness in one continuous layer. Formed concrete shall be placed in horizontal layers not more than 20 inches thick. Hoppers and chutes, pipes or “elephant trunks” shall be used as necessary to prevent splashing of mortar on the forms and reinforcing steel above the layer being placed.

Immediately after the concrete is placed in the forms, it shall be consolidated by spading, hand tamping or vibration as necessary to insure smooth surfaces and dense concrete. Each layer shall be consolidated to insure monolithic bond with the preceding layer. If the surface of a layer of concrete in place sets to the degree that it will not flow and merge with the succeeding layer when spaded or vibrated, the Contractor shall discontinue placing concrete and shall make a construction joint according to the procedure specified in Section 13.

If placing is discontinued when an incomplete horizontal layer is in place, the unfinished end of the layer shall be formed by a vertical bulkhead.

13. **CONSTRUCTION JOINTS**

Construction joints shall be made at the location shown on the drawings. If construction joints are needed which are not shown on the drawings, they shall be placed in locations approved by the Engineer.

Where a feather edge would be produced at a construction joint, as in the top surface of a sloping wall, an insert form shall be used so that the resulting edge thickness on either side of the joint is not less than 6 inches.

In walls and columns, as each lift is completed, the top surfaces shall be immediately and carefully protected from any condition that might adversely affect the hardening of the concrete.

Steel tying and form construction adjacent to concrete in place shall not be started until the concrete has cured at least 12 hours. Before new concrete is deposited on or against concrete that has hardened, the forms shall be retightened. New concrete shall not be placed until the hardened concrete has cured at least 12 hours.

Surfaces of construction joints shall be cleaned of all unsatisfactory concrete, liatance, coating or debris by washing and scrubbing with a wire brush or wire broom or by other means approved by the Engineer. The surfaces shall be kept moist for at least one hour prior to placement of the new concrete.

14. **EXPANSION AND CONTRACTION JOINTS**

Expansion and contraction joints shall be made only at locations shown on the drawings.

Exposed concrete edges and expansion and contraction joints shall be carefully tooled or chamfered, and the joints shall be free of mortar and concrete. Joint filler shall be left exposed for its full length with clean and true edges.

Preformed expansion joint filler shall be held firmly in the correct position as the concrete is placed.

When open joints are specified, they shall be constructed by insertion and subsequent removal of a wooden strip, metal plate or other suitable template in such a manner that the corners of the concrete will not be chipped or broken. The edges of open joints shall be finished with an edging tool prior to removal of the joint strips.

15. **WATERSTOPS**

Waterstops shall be held firmly in the correct position as the concrete is placed. Joints in the metal waterstops shall be soldered, brazed or welded. Joints in rubber or plastic

waterstops shall be cemented, welded or vulcanized as recommended by the Manufacturer.

16. **REMOVAL OF FORMS**

Forms shall not be removed without the approval of the Engineer. Forms shall be removed in such a way as to prevent damage to the concrete. Supports shall be removed in a manner that will permit the concrete to take the stresses due to its own weight uniformly and gradually.

17. **FINISHING FORMED SURFACES**

Immediately after the removal of the forms:

a. All fins and irregular projections shall be removed from exposed surfaces.

b. On all surfaces, the holes produced by the removal of form ties, cone-bolts, and she-bolts, shall be cleaned, wetted and filled with a dry-pack mortar consisting of one part portland cement, three parts sand that will pass a No. 16 sieve, and water just sufficient to produce a consistency such that the filling is at the point of becoming rubbery when the material is solidly packed.

18. **FINISHING UNFORMED SURFACES**

All exposed surfaces of the concrete shall be accurately screened to grade and then wood float finished, unless specified otherwise.

Excessive floating or troweling of surfaces while the concrete is soft shall not be permitted.

The addition of dry cement or water to the surface of the screened concrete to expedite finishing shall not be allowed.

Joints and edges on unformed surfaces that will be exposed to view shall be chamfered or finished with molding tools.

19. **CURING**

Concrete shall be prevented from drying for a curing period of at least 7 days after it is placed. Exposed surfaces shall be kept continuously moist for the entire period, or until curing compound is applied as specified below. Moisture shall be maintained by sprinkling, flooding, or fog spraying or by covering with continuously moistened canvas, cloth mats, straw, sand or approved material. Wood forms (except plywood) left in place during the curing period shall be kept wet. Formed surfaces shall be thoroughly wetted immediately after forms are removed and shall be kept wet until patching and repairs are

completed. Water or covering shall be applied in such a way that the concrete surface is not eroded or otherwise damaged.

Concrete, except at construction joints, may be coated with an approved curing compound in lieu of continued application of moisture. The compound shall be sprayed on the moist concrete surfaces as soon as free water has disappeared, but shall not be applied to any; surface until patching, repairs and finishing of that surface are completed. The compound shall be applied at a uniform rate of not less than one gallon per 150 square feet of surface and shall form a continuous adherent membrane over the entire surface. Curing compound shall not be applied to surfaces requiring bond to subsequently placed concrete, such as construction joints, shear plates, reinforcing steel and other embedded items. If the membrane is damaged during the curing period, the damaged area shall be re-sprayed at the rate of application specified above.

20. REMOVAL OR REPAIR

When concrete is honeycombed, damaged or otherwise defective, the Contractor shall remove and replace the structure or structural member containing the defective concrete or, where feasible, correct or repair the defective parts. The Engineer will determine the required extent of removal, replacement or repair.

Prior to starting repair work the Contractor shall obtain the Engineer's approval of his plan for effecting the repair. The Contractor shall perform all repair work in the presence of the Engineer.

21. CONCRETE IN COLD WEATHER

Concrete shall not be mixed nor placed when the daily minimum atmospheric temperature is less than 40° F unless facilities are provided to prevent the concrete from freezing. The use of accelerators or antifreeze compounds will not be allowed.

22. CONCRETE IN HOT WEATHER

The Contractor shall apply effective means to maintain the temperature of the concrete below 90° F during mixing, conveying and placing.

23. MEASUREMENT AND PAYMENT

For items of work for which specific unit prices are established in the contract, concrete will be measured to the neat lines shown on the drawings and the volume of the concrete will be computed to the nearest 0.1 cubic yard. Measurement of concrete placed against the sides of an excavation without the use of intervening forms will be made only to the neat lines or pay limits shown on the drawings. No deduction in volume will be made for

chamfers, rounded or beveled edges or for any void or embedded item that is less than 3 cubic feet in volume.

Payment for each item of concrete for minor structures will be made at the contract unit price or the contract lump sum, whichever is applicable, for that item. Such payment will constitute full compensation for all labor, materials, equipment, transportation, tools, forms, false work, bracing and all other items necessary and incidental to the completion of the work, except items listed for payment elsewhere in the contract.

Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 24 of this specification.

24. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and the construction details include:

a. Subsidiary Item, Concrete

1. This item shall consist of furnishing and placing the portland cement concrete as required to construct the footers and floor of the building, along with the pad around the outside of the building, as required and as shown on the drawings along with the necessary excavation and fill.

2. All cement used shall be a modified Type II.

3. Concrete shall be class 4000.

4. Concrete mix design will be in accordance with Section 5.

5. Minimum cement content will be 6 bags per cubic yard.

6. Class 2 course aggregate shall be size 57 (1" to No. 4, ASTM C-33 Table II).

7. Air entrainment shall be required. Air content by volume shall be 5 to 8 percent of the volume of the concrete,

8. Fly ash will not be allowed in the concrete.

9. Contractor shall be required to apply curing compound as soon as finishing has been completed.

10. The floor shall be scored on 10 foot centers. The score shall be a saw cut, ½-inch deep, and filled with silka-flex.

11. The concrete floor and footers shall rest on firm undisturbed earth or compacted gravel. All earth fill shall be compacted to ninety-five percent (95%) of standard proctor with moisture content within 2% of optimum.

12. Reinforcing steel used shall conform to ASTM GA-615, Grade 60-S. The reinforcing steel shall be placed as shown on the drawings.

13. Concrete between the building and existing curb and gutter will be colored to match the existing 'on site' concrete.

14. Measurement of the concrete will not be made but will be subsidiary to Bid Item #1. It will include the required labor, materials, and equipment necessary to meet the requirements of the specification.

CONSTRUCTION SPECIFICATION

34. STEEL REINFORCEMENT

1. SCOPE

This work shall consist of furnishing reinforcing steel, bar supports, welding, tools, supplies, equipment and services and placing of concrete reinforcement of the shape and dimensions shown on the structural drawings, and as called for in these specifications.

2. REINFORCING STEEL

a. All reinforcing bars except column spirals, shall be deformed as defined in ASTM specifications.

b. All reinforcing bars, unless noted on the structural drawings, shall be Grade 60 as defined in the American Society for Testing and Materials' "Specifications for Steel Bars for Concrete Reinforcement" (A615, A616, A617) or A706.

c. Spiral reinforcing steel shall be fabricated from cold drawn wire (ASTM A 82) or hot rolled plain or deformed bars conforming to ASTM A615, Grade 60, or ASTM A706.

d. Welded smooth wire fabric shall conform to ASTM A185 "Welded Deformed Steel Wire Fabric for Concrete Reinforcement." (ACE Building Code limits the wire spacing to 16 inches maximum.)

3. TIE WIRE

The tie wire used shall be black annealed wire, 16 ½ gauge or heavier.

4. REINFORCING BAR SUPPORTS

Bar supports shall conform to the "Bar Support Specifications" contained in "Manual of Standard Practice," as published by the Concrete Reinforcing Steel Institute.

5. MILL TEST REPORTS

A certified copy of mill test on each heat of reinforcing steel delivered showing physical and chemical analysis shall be provided, upon request, at time of shipment.

6. **SURFACE CONDITION**

Metal reinforcement at the time concrete is place shall be free from mud, oil, or other nonmetallic coatings that adversely affect bonding capacity.

Metal reinforcement, except prestressing steel, with rust, mill scale, or a combination of both shall be considered as satisfactory, provided the minimum dimensions, including height of deformations and weight of hand wire brushed test specimen, are not less than the applicable ASTM specification requirements.

7. **PLACING DRAWINGS**

The Contractor shall supply placing drawings and bar lists in accordance with latest revision of "Manual of Standard Practice for Detailing Reinforced Concrete Structures" (ACI 315), as published by the American Concrete Institute.

8. **STANDARD PRACTICE**

All requirements of concrete reinforcement not covered in these specifications or on the structural drawings shall be in accordance with "Manual of Standard Practice," as published by the Concrete Reinforcing Steel Institute.

a. All hooks shall conform to bend dimensions defined as "Standard Hooks" in "Manual of Standard Practice," as published by the Concrete Reinforcing Steel Institute, unless otherwise shown on the structural drawings.

b. Reinforcing bars shall not be bent or straightened in a manner that will injure the material.

c. Reinforcing bars shall conform accurately to within the fabrication tolerances shown in "Manual of Standard Practice," as published by the Concrete Reinforcing Steel Institute.

9. **PLACING REINFORCING STEEL**

a. The placement of bars should conform to the recommended practices in "Placing Reinforcing Bars," as published by the concrete Reinforcing Steel Institute.

b. Bars should be securely tied to prevent displacement during the concreting operation and all dowels must be wired in place before depositing concrete. Chairs shall be used for spacing of reinforcing steel.

c. All splicing of bars, concrete cover, placing tolerances and bar spacings shall

conform to "Building Code Requirements for Reinforced Concrete" (ACI 318), as published by the American Concrete Institute, and to recommended practices in "Reinforcement Anchorages and Splices" by the concrete Reinforcing Steel Institute.

d. The minimum compression dowel embedment shall be 22 bar diameter.

e. The minimum tensional development length shall be:

Bar Size	Top Bars	Other Bars
#4	17"	12"
#5	21"	15"
#6	32"	23"
#8	42"	30"

10. MEASUREMENT AND PAYMENT

(Method 1) For items of work for which specific unit prices are established in the contract, the weight of reinforcement placed in the concrete in accordance with the drawings will be determined to the nearest pound by computation from the placing drawings. Measurement of hooks and bends will be based on the requirements of ACI Standard 315. Computation of weights of reinforcement will be based on the unit weights established in Tables 34-1, 34-2, and 34-3. The area of welded wire fabric reinforcement placed in the concrete in accordance with the drawings will be determined to the nearest square foot by computation from the placing drawings with no allowance for laps. The weight of steel reinforcing in extra spliced or extra-length splices approved for the convenience of the Contractor or the weight of supports and ties will not be included in the measurement for payment.

Payment for furnishing and placing reinforcing steel will be made at the contract unit price. Such payment will constitute full compensation for all labor, materials, equipment and all other items necessary and incidental to the completion of the work including preparing and furnishing bar schedules, lists, or diagrams; furnishing and attaching ties and supports; and furnishing, transporting, cutting, bending, cleaning, and securing all reinforcement.

(Method 2) For items of work which specific unit prices are established in the contract, the weight of bar reinforcement placed in the concrete in accordance with the drawings will be determined to the nearest pound by computation from the placing drawings. Measurement of hooks and bends will be based on the requirements of ACI Standard 315. Computation of weights of bar reinforcement will be based on the unit weights established in Table 34-1. The weight of steel reinforcing in extra splices or extra-length splices approved for the convenience of Contractor or the weight of supports and ties will not be included in the measurement for payment.

The area of welded wire fabric reinforcement placed in the concrete in accordance with the

drawings will be determined to the nearest square foot be computation from the placing drawings with no allowance for laps.

Payment for furnishing and placing bar reinforcing steel will be made at the contract unit price for bar reinforcement. Payment for furnishing and placing welded wire fabric reinforcing steel will be made at the contract unit price for welded wire fabric reinforcement. Such payment will constitute full compensation for all labor, materials, equipment, and all other items necessary and incidental to the completion of the work including preparing and furnishing bar schedules, lists of diagrams; furnishing and attaching ties and supports; and furnishing, transporting, cutting, bending, cleaning, and securing all reinforcement.

(Use with Either Method) Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and items to which they are made subsidiary are identified in Section 8 of this specification.

11. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and construction details thereof are:

a. Subsidiary Bid Item, Reinforcing Steel

1. This item shall consist of furnishing and installing all steel reinforcement required in the concrete as shown on the drawings or as called for in these specifications.

2. Reinforcing steel shall be ASTM GA-615 Grade 60-S, A305 deformations.

3. All horizontal steel mats shall be supported in place by metal chairs or concrete blocks and chairs shall be used for spacing of reinforcing steel.

4. All splicing of bars, concrete cover, placing tolerances and bar spacings shall conform to "Building Code Requirements for Reinforced Concrete" (ACI 318), as published by the American Concrete Institute, and to recommended practices in "Reinforcement Anchorages and Splices" by the concrete Reinforcing Steel Institute.

5. The minimum compression dowel embedment shall be 22 bar diameter.

6. The minimum tensional development length shall be:

Bar Size	Top Bars	Other Bars
#4	17"	12"
#5	21"	15"
#6	32"	23"
#8	42"	30"

7. Measurement and payment will not be made as this item is subsidiary to other bid items.

Table 34-1: ASTM STANDARD REINFORCING BARS

Bar Size, No.	**Nominal diameter, in.**	**Nominal area, in.^{2}**	**Nominal weight, lb/ft**
3	0.375	0.11	0.376
4	0.500	0.20	0.668
5	0.625	0.31	1.043
6	0.750	0.44	1.502
7	0.875	0.60	2.044
8	1.000	0.79	2.670
9	1.128	1.00	3.400
10	1.270	1.27	4.303
11	1.410	1.56	5.313
14	1.693	2.25	7.650
18	2.257	4.00	13.600

Table 34-2 ASTM STANDARD PRESTRESSING TENDONS

Type*	Nominal diameter, in.	Nominal area, in. ^{2}	Nominal weight, lb/ft
Seven -wire strand (Grade 250)	1/4 (0.250)	0.036	0.12
	5/16 (0.313)	0.058	0.20
	3/8 (0.375)	0.080	0.27
	7/16 (0.438)	0.108	0.37
	½ (0.500)	0.144	0.49
	(0.600)	0.216	0.74
Seven -wire strand (Grade 270)	3/8 (0.375)	0.085	0.29
	7/16 (0.438)	0.115	0.40
	½ (0.500)	0.153	0.53
	(0.600)	0.215	0.74
Prestressing bars	0.192	0.029	0.098
	0.196	0.030	0.10
	0.250	0.049	0.17
	0.276	0.060	0.20
Prestressing bars (plain)	3/4	0.44	1.50
	7/8	0.60	2.04
	1	0.78	2.67
	1-1/8	0.99	3.38
	1-1/4	1.23	4.17
	1-3/8	1.48	5.05
Prestressing bars (deformed)	5/8	0.28	0.98
	3/4	0.42	1.49
	1	0.85	3.01
	1-1/4	1.25	4.39
	1-3/8	1.56	5.56

TABLE 34-3. SQUARE WELDED WIRE FABRIC

[1]

Style Designation	Wt. in Lb. Per 100Sq. Ft.	Style Designation	Wt. in Lb. Per100Sq.Ft.
2 x 2 - 10/10	60	4 x 4 - 14/14	11
2 x 2 - 12/12	37	6 x 6 - 0/0	107
2 x 2 - 14/14	21	6 x 6 - 1/1	91
2 x 2 - 16/16	13	6 x 6 - 2/2	78
3 x 3 - 8/8	58	6 x 6 - 3/3	68
3 x 3 - 10/10	41	6 x 6 - 4/4	58
3 x 3 - 12/12	25	6 x 6 - 4/6	50
3 x 3 - 14/14	14	6 x 6 - 5/5	49
4 x 4 - 4/4	85	6 x 6 - 6/6	42
4 x 4 - 6/6	62	6 x 6 - 7/7	36
4 x 4 - 8/8	44	6 x 6 - 8/8	30
4 x 4 - 10/10	31	6 x 6 - 9/9	25
4 x 4 - 12/12	19	6 x 6 - 10/10	21
4 x 4 - 13/13	14		

[1]Style designation is defined in ACI Standard 315 of the American Concrete Institute.

CONSTRUCTION SPECIFICATION

35. DISINFECTION, TESTING, & GUARANTEE

1. **SCOPE**

This Specification shall apply to the Disinfecting, testing, and the guarantee of all water storage reservoirs which are constructed or relocated under the terms of this contract.

2. **DISINFECTING AND TESTING**

After the tank has been painted and disinfected, the tank shall be filled to the overflow level with water to which sufficient chlorine is added to produce a concentration of at least 50 parts per million of available chlorine. Chlorine shall be applied as specified in the attached Specification "Disinfection the Reservoir". The disinfecting solution shall be retained for 24 hours. This 24 hour period shall also constitute the required test for tank leakage. Any leaks which are disclosed in the test shall be repaired. After the holding period, the highly chlorinated water in the tank shall be drained and wasted.

Contractor shall be responsible for obtaining the quality of water necessary to perform the required tests and to pay the cost providing the same.

After the filling and 24 hour testing period, the water shall have a chlorine residual of at least 25 ppm. If this residual is not met, it shall be required to repeat the disinfection process until full compliance of the requirement are attained.

Bacteriological samples shall be taken by the Contractor and tested at his expense to conform disinfection. Negative test results will require the tank to be rechlorinated and retested.

3. **GUARANTEE**

The Contractor shall guarantee the reservoir against any defects in design, materials, or workmanship for a period of one (1) year form the date of acceptance of the work by the Engineer and shall make any repairs or replacement necessitated by such defects without cost to the owner.

4. **MEASUREMENT AND PAYMENT**

Measurement and Payment will be a specified in Section 5 "Items of Work and Construction Details."

5. **ITEMS OF WORK AND CONSTRUCTION DETAILS**

Items of work to be performed in accordance with this specification and construction details are:

a. Subsidiary Item, Disinfection, Testing, & Guarantee

1. This item shall include disinfection, testing and guarantee of the cistern tank and water system.

2. Disinfection of the reservoir shall be required.

3. The Contractor shall provide testing water onsite. The Contractor will flush the system at the conclusion of the tests.

4. Measurement and payment will not be made. Compensation for this work is subsidiary to Bid Item 1.

CONSTRUCTION SPECIFICATION

36. DISINFECTING THE RESERVOIR

1. **SCOPE**

Before the reservoir is put into service and in conjunction with leakage testing of the reservoir, it shall be rendered safe from contamination by disinfection.

Before the disinfecting process is begun, all foreign material shall be removed from the interior and all surfaces washed down by spraying. During this operation the inlet pipe shall be tightly plugged and all foreign materials washed down the drain pipe.

2. **FORM OF APPLIED CHLORINE**

Any of the following methods of procedure shall be followed, subject to the approval of the Engineer:

a. Liquid chlorine gas-water mixture.
b. Direct chlorine feed.
c. Calcium or sodium hypochlorite and water mixture.
d. Chlorinated lime and water mixture.

3. **LIQUID CHLORINE SOLUTION**

A chlorine gas-water mixture shall be applied by means of a solution-feed chlorinating device, or, if approved by the Engineer, the dry gas may be fed directly through proper devices for regulating the rate of flow and providing effective diffusion of the gas into the water within the pipe supplying water to the reservoir being treated. Chlorinating devices for feeding solutions of the chlorine gas, or the gas itself must provide means for preventing the backflow of water into the chlorine cylinder.

4. **CHLORINE-BEARING COMPOUNDS IN WATER**

On approval of the Engineer, a mixture of water and a chlorine-bearing compound of known chlorine content may be used in lieu of liquid chlorine.

a. Calcium hypochlorite
b. Chlorinated lime
c. Sodium hypochlorite

5. **CHLORINE CONCENTRATION**

Sufficient chlorine shall be added to give concentration of at least 50 parts per million of available chlorine. Following is a table giving the minimum amounts of chlorine necessary to obtain the 50 ppm of available chlorine:

CHLORINE REQUIREMENTS FOR 50 PPM

Capacity gallons	liquid chlorine chlorite pounds	70% Hypochlorite pounds	50% Hypochlorite pounds	25% Hypochlorite pounds	12% Hypochlorite pounds	5.155 Hypochlorite pounds
1,000	0.416	0.6	0.83	1.7	0.5	1
2,000	0.833	1.2	-1.7	3.4	1.0	2
5,000	2.08	3	4.2	8.4	2	5
10,000	4.16	6	8.3	17	4	10
20,000	8.33	12	17	33	8	19
30000	12.5	18	25	50	12.5	29
40,000	16.7	24	33	67	17	38
50,000	20.8	30	42	83	21	48
75,000	31.2	45	63	125	31	72
100,000	41.6	60	83	167	41	96
200,000	83.3	119	167	333	83	190
300000	125	179	250	500	125	286
500,000	208	298	417	833	208	476
700,000	292	417	583	1170	292	670
1,000,000	416	595	833	1668	416	955

When using solution-fed or dry feed devices, the point of application shall be in the inlet pipe by means of a tap through the wall of the pipe within one (1) floor of the inlet valve. After the operation is completed, a cast iron plug shall be inserted in the tapped hole.

If hypo-chlorite compounds are used, it will be necessary to “swab-out” the inlet pipe with a solution of 200 ppm of available chlorine. This may be done by mounting a swab or mop of sufficient size to made good contact with all portions of the pipe, on a long pole, and after soaking with the hypo-chlorite solution, applied to the inside of the pipe. The swab should be inserted in the sufficient distance to make full contact with the gate on the inlet valve. The swabbing operation shall be repeated a minimum of five (5) times. The hypochlorite compound may then be spread evenly over the floor of the reservoir and the filling process begun.

In lieu of the methods described above, disinfections may be effected by swabbing or spraying the walls, floor, and ceiling with a solution containing 200 ppm of available chlorine. It shall be necessary to swab the inlet pipe also, as described in this Specification. After the swabbing operation is completed, there shall be a minimum waiting period of two (2) hours before the filling operation is begun.

After the filling and 24-hour testing period, the water shall have a chlorine residual of at least 25 ppm. If this residual is not met, it shall be required to repeat the disinfection process until full compliance of the requirements is attained. This shall apply to all methods of disinfection.

The Contractor shall exercise extreme precaution in preventing disinfecting water or any foreign material from entering the supply pipe, and thus contaminating the Owners’ water supply.

If it shall become necessary to enter the reservoir for repairs or any other reason prior to final acceptance of the project, the complete disinfection process shall be repeated as specified.